

12-1-2015

Place Experience of Nursing Home Courtyards: a Holistic Approach to Understanding Institutional Outdoor Environments

Chia Jung Shih

University of Wisconsin-Milwaukee

Follow this and additional works at: <https://dc.uwm.edu/etd>



Part of the [Architecture Commons](#), and the [Nursing Commons](#)

Recommended Citation

Shih, Chia Jung, "Place Experience of Nursing Home Courtyards: a Holistic Approach to Understanding Institutional Outdoor Environments" (2015). *Theses and Dissertations*. 1081.

<https://dc.uwm.edu/etd/1081>

This Dissertation is brought to you for free and open access by UWM Digital Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of UWM Digital Commons. For more information, please contact open-access@uwm.edu.

PLACE EXPERIENCE OF NURSING HOME COURTYARDS:
A HOLISTIC APPROACH TO UNDERSTANDING INSTITUTIONAL OUTDOOR ENVIRONMENTS

by

Chia-Jung Shih

A Dissertation Submitted in
Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy
in Architecture

at

The University of Wisconsin-Milwaukee

December 2015

ABSTRACT

PLACE EXPERIENCE OF NURSING HOME COURTYARDS: A HOLISTIC APPROACH TO UNDERSTANDING EXPERIENTIAL ATTRIBUTES OF INSTITUTIONAL OUTDOOR ENVIRONMENTS

by

Chia Jung Shih

The University of Wisconsin-Milwaukee, 2015
Under the Supervision of Professor Gerald Weisman

This dissertation research investigates place experience of three nursing home courtyards. Based on systemic place theories, each nursing home courtyard is conceptualized as place or a system consisting of three major subsystems: physical settings, people and rules of place uses. Place experience as the center of conceptualization is the result of interactions between them. Place experience is thus characterized by objective, subjective and consensual qualities of people-environment relationships. The research design follows the premises of pragmatic case study methodology; a mixed research method is employed that includes archival research of floor plans, photo documentation, a physical setting checklist and instrumented measures for physical environments; staff interviews, surveys and auditing evaluations for organizational and staff contexts; and resident interviews and behavior mapping for individual contexts and place rules. Through synthesizing different sources of data into experiential descriptions, this study suggests that each courtyard is a compound of nine desired experiential attributes including 1) privacy, 2) social interactions, 3) accessible space and built features, 4) safety & security, 5) sensory stimulation, 6) information awareness and spatial

orientation, 7) familiarity, 8) sense of ownership and 9) participation in meaningful activities. Each courtyard is unique in its distinct composition of these attributes and arrangements of the three subsystems. Experience of social interactions is the shared experiential quality across the cases. The three courtyards are programmed as a social space but are not meant to be a place to mark ownership, show identities and create meaningful engagement. The shared nature is incongruent with residents' experience of home gardens and gardening collected from the interviews. A relatively successful case is selected; it is a place with more equal emphases on the nine attributes. Its patterns of the three subsystems may guide a less effective case to make future improvement.

Implications of the findings are considered at three levels. First, this study applied a pragmatic approach, which offers a means to generate a holistic understanding of institutional outdoor environments; this study may complement the current research dominated by a positivist approach. Second, the approach recognizes and acknowledges the multifaceted phenomenon of the courtyards; it describes sets of variables or quality indicators that may help further theoretical construction or the development of quality measure. Third, this comparative research highlights the importance of establishing a database of cases reports. The accumulation of successful cases would help identify effective patterns of the three subsystems. Shared features emerging from successful cases may represent findings with high generalizability.

© Copyright by Chia Jung Shih, 2015
All Rights Reserved

To
My guru, Gangkar Rinpoche,
my parents,
and especially my pipi,
for their love and support through this wonderful journey

TABLE OF CONTENTS

CHAPTER 1 : INTRODUCTION	1
I. Outdoor Environments of Nursing Homes as Place	4
II. Impasse of Current Research	7
III. The Purpose of The Study	9
IV. The Significance of the Study.....	9
CHAPTER 2 : LITERATURE REVIEW	11
I. Analysis of Paradigm: Need for an Alternative Approach.....	12
A. Analysis based on Altman & Rogoff's taxonomy of worldviews.....	12
B. Analysis based on Lawton's taxonomy of functions of environments	17
II. Analysis of Theoretical Origins: Need for an Integrative Approach.....	38
A. Perception & cognition: stimulating-based studies.....	38
B. Unclear position: supporting-based studies	42
C. Action, knowledge & meaning: maintaining-based studies	42
III. Consensus across Studies: Experiential Attributes	45
A. Recurring experiential themes across studies	45
CHAPTER 3 : CONCEPTUAL FRAMEWORK.....	53
I. Conceptualizing Coexistence of Multiple Paradigms	53
A. James's conceptualization of truth: Workability	54
B. Polkinghorne's neo-pragmatism: postmodern epistemology of practice	58
C. Fishman's pragmatic psychology: practice as inquiry.....	60
D. Groat and Wang's intersubjectivism: bridging design and research	68
II. Systemic Theories	72
A. Aristotle's psychology	74
B. Brunswik's ecological environments and probabilistic theory	76
C. Systemic model: Barker, Moos, Canter, Weisman.....	78
III. Conceptualization of Experiential Outdoor Environments in Nursing Homes	116
A. Pragmatic worldviews.....	116
B. Ecological environments	119
C. Place experience and experiential attributes	126
CHAPTER 4 : METHODOLOGY	145
I. Research Questions.....	145
II. Research Design: Pragmatic Case Study	146
A. Case selection	149
III. Facility Background of the Three Courtyards.....	152
IV. Data Collection.....	154
A. Physical settings	154
B. People component.....	161

C. Rules of place use.....	163
V. Data Analysis.....	165
CHAPTER 5 : PHYSICAL SETTINGS OF THREE NURSING HOME COURTYARDS	176
I. Properties of Physical Setting	176
A. Variables of spatial properties	176
B. Variables of sensory properties	177
C. Variables of building systems: built & human-made features.....	179
D. Support of experience attributes.....	181
II. Courtyard at Silver Life.....	181
A. Overview of facility building	181
B. Physical settings of the courtyard.....	182
C. Support of experience attributes.....	210
III. Courtyard at Golden Age.....	211
A. Overview of facility building	211
B. Physical settings of courtyard space	212
C. Support of experience attributes.....	234
IV. Courtyard at Elderly Living	236
A. Overview of facility building	236
B. Physical settings of the courtyard.....	237
C. Support of experience attributes.....	261
V. Comparison of Physical Settings	262
CHAPTER 6 : PEOPLE COMPONENTS OF THE THREE NURSING HOME COURTYARDS.....	275
I. Silver Life Nursing Home	276
A. Organizational context.....	276
B. Staff-resident relations in outdoor programs.....	288
C. Resident profile.....	292
II. Golden Age Nursing Home.....	312
A. Organizational context.....	312
B. Staff-resident relation in outdoor programs	322
C. Resident profile.....	328
III. Elderly Living Nursing Home	335
A. Organizational context.....	335
B. Staff-resident relations in outdoor programs.....	345
C. Resident profile.....	352
IV. Comparison of people components between the cases	356
A. Organizational context.....	356
B. Staff-resident interactions	362
C. Resident profile.....	366
CHAPTER 7 : PLACE RULES OF THE THREE NURSING HOME COURTYARDS.....	385
I. Internal Rules of Silver Life's Courtyard	386
A. General patterns of courtyard uses	386
B. Pattern of rules	391

C. Linkage of the experiential attributes.....	402
II. Internal Rule of Golden Age's Courtyard	406
A. General patterns of courtyard uses	406
B. Pattern of rules	410
C. Linkage of the experiential attributes.....	423
III. The Hidden Rule of Elderly Living's Courtyard	426
A. General patterns of courtyard uses	426
B. Pattern of rules	431
C. Linkage of the experiential attributes.....	444
IV. Comparison of Hidden Rules	446
A. General patterns of courtyard users.....	446
B. Patterns of rules.....	449
C. Linkage of the nine experiential attributes.....	450
 CHAPTER 8 : PLACE EXPERIENCE OF THE NURSING HOME COURTYARDS	 453
I. Contexts and Place Experience	455
A. Silver Life's courtyard.....	455
B. Golden Age's courtyard	463
C. Elderly Living's courtyard.....	471
II. The Shared Experiential Quality among the Three Courtyards	480
III. Successful and Unsuccessful Cases	482
 CHAPTER 9 : DISCUSSION.....	 489
I. Discussion of Theory, Methodology and Practice.....	489
A. A pragmatic place	489
B. Synthesis of data from a mixed research method	492
C. Theory and practice: two sides of the same coin	494
II. Validity, Applicability and Reproducibility	498
III. Limitations of This Study	503
A. A lack of existing case reports.....	503
B. Requirement of multidisciplinary approach	504
C. Issues of method and measurement	505
IV. Implications and Future Directions.....	508
 BIBLIOGRAPHY	 512
 APPENDICES	 550
Appendix A: Experiential Themes Derived From Descriptions of Physical Settings in Literature.....	550
Appendix B: Experiential Themes Derived From Descriptions of Organizations in Literature	580
Appendix C: Experiential Themes Derived From Descriptions of Staff Practice in Literature	586
Appendix D: Evaluation Tool for Physical Settings of Pilot Cases	589
Appendix E: Variables of Physical Settings Derived from Literature and Their Groupings.....	593
Appendix F: Physical Setting Checklist	596

Appendix G: Courtyard Audit Tool for Physical Settings.....	600
Appendix H: Policy and Program Information Form & Resident & Staff Information Form.....	606
Appendix I: Organizational and Staff Variables in Literature and Their Groupings	617
Appendix J: Nursing Home Courtyard Audit Tool for Organization	621
Appendix K: Nursing Home Courtyard Audit Tool for Staff-Resident Interactions.....	624
Appendix L: Example of Behavior Map & Behavior Checklist	628
Appendix M: Narratives from Resident Interviews of Home Garden/Gardening	631
Appendix N: Rules of Silver Life’s Courtyard.....	683
Appendix O: Rules of Golden Age’s Courtyard	687
Appendix P: Rules of Elderly Living’s Courtyard.....	692
Appendix Q: Theories of Environmental Perception and Cognition Shaping Research on Institutional Outdoor Environments.....	698
Appendix R: Theories of Environmental Action, Knowledge, Evaluation and Meaning Shaping Research on Institutional Outdoor Environments	730
Appendix S: Analysis of Architecture Layout of Silver Life.....	751
Appendix T: Analysis of Architecture Layout of Golden Age	758
Appendix U: Analysis of Architecture Layout of Elderly Living	766
CURRICULUM VITAE.....	774

LIST OF FIGURES

Figure 2-1. Grant & Wineman's garden-use model. Reprinted from Grant & Wineman (2007, p. 109)....	34
Figure 2-2. Theoretical origin of the reviewed articles.....	40
Figure 3-1. Professional activity as applied science (Reprinted from Fishman, 1999, p. 10)	62
Figure 3-2. Professional activity as disciplined inquiry (Adapted from Fishman, 1999, p. 11).....	64
Figure 3-3. Susman's action-research diagram (Reprinted from Susman, 1983, p. 95)	70
Figure 3-4. Architectural research as practice. Modified from (Fishman, 1999, p. 11).....	71
Figure 3-5. The angle of view derived from the four systemic models	80
Figure 3-6. An attempt to outline concept of behavior setting.....	83
Figure 3-7. Cluster of patterns for a place. Reprinted from Silverstein & Jacobson (1985, p. 153)	84
Figure 3-8. Moos's model of social climate. Reprinted from (Moos, 1981, p. 7)	86
Figure 3-9. Canter's model of place in 1977. Reprinted from Canter (1977, p. 158)	93
Figure 3-10. An attempt to outline Canter's model in 1991. Adapted from Canter (1991, p. 206)	94
Figure 3-11. Application of Weisman's model of place in placemaking. Reprinted from Weisman (2001, p. 21)	104
Figure 3-12. Weisman's place model. Reprinted from Weisman (2001, p. 21).....	104
Figure 3-13. An attempt of schematizing Cresswell's approach toward co-existence of different paradigms of place.....	109
Figure 3-14. An attempt of schematizing Casey's typology of memory	115
Figure 3-15. Place Model of Experiential Outdoor Environments of Nursing Homes	117
Figure 4-1. The flow of data collection	156
Figure 4-2. HSB color model. Reprinted from HSL and HSV, 2015, retrieved from http://en.wikipedia.org/wiki/HSL_and_HSV	169
Figure 4-3. A HSB histogram (left) and color 3D model (right) generated by ImageJ	170

Figure 4-4. Example of statistic results produced.....	170
Figure 4-5. Criteria of color descriptions in Image Color Summarizer (Krzywinski, 2006)	171
Figure 5-1. Indoor spaces with visual access to the courtyard at Silver Life	185
Figure 5-2. Visibility analysis of the courtyard at Silver Life	186
Figure 5-3. Depth-path analysis of the courtyard at Silver Life	186
Figure 5-4. Isovist analysis from the activity room and chapel in Silver Life	187
Figure 5-5. Isovist analysis from the entry at Corridor A, activity alcove, family private meeting/dining room and OT/PT room in Silver Life.....	187
Figure 5-6. Isovist analysis from two resident rooms at Corridor B looking at the courtyard of Silver Life	187
Figure 5-7. Isovist analysis from the entry at Corridor C, and day room looking at the courtyard of Silver Life.....	187
Figure 5-8. Isovist analysis at the four corridors looking at the courtyard of Silver Life	188
Figure 5-9. Drawing of 20-foot visual buffer zone of the courtyard at Silver Life	188
Figure 5-10. Layout of the courtyard at Silver Life.....	190
Figure 5-11. Simulating the central patio of the courtyard at Silver Life with sunlight at 10:00 am.....	191
Figure 5-12. Simulating the porch of the courtyard at Silver Life with sunlight at 3:00 pm.....	191
Figure 5-13. Twelve selected images for color analysis of the courtyard at Silver Life	195
Figure 5-14. Scores of physical settings of Silver Life	210
Figure 5-15. Indoor spaces with visual access to the courtyard at Golden Age	216
Figure 5-16. Visibility analysis of the courtyard at Golden Age	216
Figure 5-17. Depth-path analysis of the courtyard at Golden Age	217
Figure 5-18. Isovist analysis from the dining rooms looking at the courtyard of Golden Age	217
Figure 5-19. Isovist analysis from the administration and activity office looking at the courtyard of Golden Age.....	217

Figure 5-20. Isovist analysis from two bedrooms at Corridor B and C looking at the courtyard of Golden Age	218
Figure 5-21. Isovist analysis at the four corridors looking at the courtyard of Golden Age	218
Figure 5-22. Drawing of 20-foot visual buffer zone of the courtyard at Golden Age	219
Figure 5-23. Layout of the courtyard at Golden Age	220
Figure 5-24. Simulating the courtyard at Golden Age with sunlight at 10:00 am	221
Figure 5-25. Simulating the courtyard at Golden Age with sunlight at 3:00 pm	221
Figure 5-26. Thirteen selected images for color analysis	224
Figure 5-27. Results of assessing physical environments of the courtyard at Golden Age	235
Figure 5-28. Indoor spaces with visual access to the courtyard at Elderly Living.....	239
Figure 5-29. Visibility analysis of the courtyard at Elderly Living.....	240
Figure 5-30. Depth-path analysis of the courtyard at Elderly Living.....	240
Figure 5-31. Isovist analysis at the dining room looking at the courtyard of Elderly Living	241
Figure 5-32. Isovist analysis at the lounge at Corridor B looking at the courtyard of Elderly Living	241
Figure 5-33. Isovist analysis at resident rooms in Corridor B looking at the courtyard of Elderly Living .	241
Figure 5-34. Isovist analysis at resident rooms in Corridor D looking at the courtyard of Elderly Living.	241
Figure 5-35. Isovist analysis at the corridors looking at the courtyard of Elderly Living	242
Figure 5-36. Drawing of 20-foot visual buffer zone of the courtyard at Elderly Living	242
Figure 5-37. Layout of the courtyard at Elderly Living.....	243
Figure 5-38. Simulating the courtyard at Elderly Living with sunlight at 11:00 am.....	245
Figure 5-39. Simulating the courtyard at Elderly Living with sunlight at 1:00 pm.....	245
Figure 5-40. Simulating a close-up view of the courtyard at Elderly Living with sunlight at 1:00 pm.....	246
Figure 5-41. Simulating a close-up view of the central patio at Elderly Living with sunlight at 1:00 pm.	246
Figure 5-42. Thirteen images for color analysis of the courtyard at Elderly Living	249

Figure 5-43. Result of assessing physical environments of the courtyard at Elderly Living	262
Figure 5-44. Comparison of auditing assessment among the three cases	274
Figure 5-45. Comparison of scores among the nine experiential dimensions in the researcher's evaluation	274
Figure 6-1. Auditing scores of organizational aspects of the courtyard at Silver Life	287
Figure 6-2. Auditing scores of staff-resident interactions	292
Figure 6-3. Auditing scores of organizational aspects of the courtyard at Golden Age	322
Figure 6-4. Auditing scores of staff-resident relations in the courtyard of Golden Age.....	328
Figure 6-5. Auditing scores of organizational aspects of the courtyard at Elderly Living.....	345
Figure 6-6. Auditing scores of resident-staff relations in the courtyard at Elderly Living	351
Figure 6-7. Comparison of organizational auditing scores between the cases	361
Figure 6-8. Comparison of auditing scores of staff-resident relations between the cases	366
Figure 6-9. Frequency of the nine experiential attributes.....	371
Figure 7-1. System of place rules. Modified from Silverstein & Jacobson (1985)	385
Figure 7-2. Group types by days in Silver Life	388
Figure 7-3. Types of activity and their frequency in Silver Life's courtyard.....	390
Figure 7-4. Pattern of internal rules in the courtyard of Silver Life	400
Figure 7-5. Grouping and evaluating the rules of Silver Life.....	405
Figure 7-6. Group types by days in Golden Age.....	408
Figure 7-7. Types of activity and their frequency in the courtyard of Golden Age	409
Figure 7-8. Pattern of internal rules in the courtyard of Golden Age.....	421
Figure 7-9. Grouping and evaluating the rules of Golden Age	425
Figure 7-10. Group types by days in Elderly Living	428
Figure 7-11. Types of activity and their frequency in the courtyard of Elderly Living.....	430

Figure 7-12. Pattern of internal rules of the courtyard at Elderly Living	441
Figure 7-13. Grouping and evaluating the rules of Elderly Living	446
Figure 7-14. Convergence of evaluation of all the internal rules	452
Figure 8-1. Average ranking scores of the three courtyards in the nine attributes	483
Figure 8-2. Patterns that enhances social interactions, familiarity and awareness & orientation	485
Figure 8-3. Pattern that enhance sense of ownership.....	486
Figure 8-4. Pattern that enhances or compromise privacy	487
Figure 9-1. Transformation of data.....	493
Figure 9-2. Architectural research as practice II	497

LIST OF TABLES

Table 2-1. Worldviews of the review articles	14
Table 2-2. Groupings of the reviewed article based on Lawton's taxonomy	18
Table 2-3. Maintaining-based studies.....	22
Table 2-4. Results of hypothesis testing among the stimulating-based studies.....	26
Table 2-5. Stimulating-based studies.....	27
Table 2-6. Features listed as attractants to outdoor usage by Rodiek (2006).....	31
Table 2-7. Perceived outdoor barriers listed by Rodiek (2006)	33
Table 2-8. Supporting-based studies	36
Table 2-9. Theories applied in the stimulating-based articles.....	41
Table 2-10. Theories applied in the supporting-based studies.....	42
Table 2-11. Theories applied in the maintaining-based studies	44
Table 3-1. Summary of paradigmatic influence on pragmatism (Adapted from Fishman, 1999, p. 99)	61
Table 3-2. Groat and Wang's tripartite framework of research paradigms (Reprinted from Groat & Wang, 2002, p. 32).....	69
Table 3-3. Comparison between systemic thinking, constructivism and positivism of P-E relations.....	73
Table 3-4. Comparison of systemic models proposed by Barker, Moos, Canter and Weisman (Developed based on Weisman, 1997, p. 326).....	79
Table 3-5. Weisman's application of experiential, activity and architectural programs in planning and programming an adult day care center. Adapted from Moos et al (2001, p. 27)	103
Table 4-1. Comparison of facility background of three cases.....	153
Table 4-2. Definition of NodeXL metrics (Hansen et al., 2010).....	167
Table 5-1. Variables of spatial properties	177
Table 5-2. Variables of sensory properties	177

Table 5-3. Building system variables.....	180
Table 5-4. Distance between the courtyard and major indoor spaces in Silver Life	183
Table 5-5. Comparison of Silver Life’s square footage per bed for outdoor space with state-level requirements	193
Table 5-6. Results of color analysis of the courtyard at Silver Life	197
Table 5-7. Comparison of Silver Life’s sound levels with different criteria defining “quietness”	202
Table 5-8. Beaufort’s criterion of wind. Modified from Sanz-Andres & Cuerva (2006)	204
Table 5-9. Wind speed at the courtyard of Silver Life (mph).....	204
Table 5-10. Air temperature between July 3rd and 11th , 2013 (°F).....	204
Table 5-11. Temperature measured at the courtyard of Silver Life	205
Table 5-12. Comparison of Silver Life’s courtyard temperature with state-level requirement of thermal comfort	206
Table 5-13. Building systems: built & human-made elements of the courtyard at Silver Life	209
Table 5-14. Distance between the courtyard and major indoor spaces in Golden Age	213
Table 5-15. Comparison of Golden Age’s square footage per bed for outdoor space with state-level ...	223
Table 5-16. Results of color analysis of the courtyard of Golden Age	225
Table 5-17. Comparison of Golden Age’s sound levels with different criteria defining “quietness”	230
Table 5-18. Wind speeds of the courtyard at Golden Age (mph).....	231
Table 5-19. Air temperature between July 3rd and 11th , 2013 (°F) at the courtyard of Golden Age	231
Table 5-20. Temperature measured at the courtyard (°F) at the courtyard of Golden Age	231
Table 5-21. Comparison of the Golden Age’s temperature with state-level requirement of thermal comfort (°F).....	232
Table 5-22. Building-system elements in the courtyard of Golden Age	234
Table 5-23. Distance between the courtyard and major indoor spaces in Elderly Living.....	238

Table 5-24. Comparison of Elderly Living’s square footage per bed for outdoor space with state-level.	247
Table 5-25. Results of color analysis of the courtyard at Elderly Living.....	251
Table 5-26. Comparison of Silver Life’s sound levels with different criteria defining “quietness”	255
Table 5-27. Wind speed at the courtyard of Elderly Living (mph)	256
Table 5-28. Air temperature between July 2rd and 14th , 2013 (°F).....	257
Table 5-29. Temperature measured at the courtyard of Elderly Living.....	258
Table 5-30. Comparison of Elderly Living’s temperature with state-level requirement of thermal comfort	258
Table 5-31. Built & human-made elements in the courtyard of Elderly Living.....	260
Table 5-32. Comparison of facility buildings among the three cases	264
Table 5-33. Comparison of spatial properties among the three cases	268
Table 5-34. Comparison of sensory properties among the three cases	270
Table 5-35. Comparison of built & human-made elements among the three cases.....	271
Table 6-1. Silver Life’s scores of POLIF	277
Table 6-2. Percentage of the residents in carrying activities of daily living in Silver Life	294
Table 6-3. Percentage of the residents take part in the following activities	294
Table 6-4. Major themes and their frequency emerging from resident interviews in Silver Life.....	295
Table 6-5. Golden Age’s scores of POLIF	313
Table 6-6. Percentage of the residents in carrying activities of daily living in Golden Age	330
Table 6-7. Percentage of the residents take part in the	331
Table 6-8. Major themes and their frequency emerging from resident interviews in Golden Age	332
Table 6-9. Elderly Living’s scores of POLIF	336
Table 6-10. Major themes and their frequency emerging from resident interviews in Elderly Living.....	354
Table 6-11. Comparison of organizational characteristics between the cases	356

Table 6-12. Comparison of staff-resident interactions between the cases.....	362
Table 6-13. Comparison of resident profile between the cases	368
Table 6-14. Results of content analysis derived from the 43 interviews.....	369
Table 6-15. Groupings of sub-themes by the nine experiential attributes.....	370
Table 7-1. Person-times of Silver Life’s courtyard users.....	386
Table 7-2. Gender and mobility of resident users in Silver Life	386
Table 7-3. Outdoor residents by group types of Silver Life	387
Table 7-4. Group types by days in the courtyard of Silver Life	387
Table 7-5. Total person-times of courtyard users by time in Silver Life	389
Table 7-6. Types of activity observed in Silver Life’s courtyard.....	389
Table 7-7. Sub-themes of rules observed in Silver Life.....	391
Table 7-8. Grouping and evaluating the rules of Silver Life.....	403
Table 7-9. Person-times of courtyard users in Golden Age	406
Table 7-10. Gender and mobility of resident users in the courtyard at Golden Age.....	406
Table 7-11. Outdoor residents by group types in the courtyard of Golden Age	407
Table 7-12. Group types by days in Golden Age	407
Table 7-13. Total person-times of courtyard users by time in Golden Age	408
Table 7-14. Types of activity in the courtyard of Golden Age	409
Table 7-15. Sub-themes of rules observed in Golden Age.....	410
Table 7-16. Grouping and evaluating the rules of Golden Age.....	423
Table 7-17. Total person-times of Elderly Living’s courtyard users.....	426
Table 7-18. Gender and mobility of resident users in Elderly Living	426
Table 7-19. Outdoor residents by group types of Elderly Living.....	427
Table 7-20. Group types by days in Elderly Living.....	427

Table 7-21. Total person-times of courtyard users by time in Elderly Living	429
Table 7-22. Types of activity in the courtyard of Elderly Living	429
Table 7-23. Sub-themes of rules observed in Elderly Living	431
Table 7-24. Grouping and evaluating the rules of Elderly Living	444
Table 7-25. Comparison of general patterns of courtyard use	448
Table 7-26. Comparison of patterns of implicit rules	451
Table 7-27. Comparison of evaluation of rules related to the nine attributes	451
Table 8-1. Place experience of Silver Life’s courtyard	459
Table 8-2. Comparison of place experience between Silver Life’s courtyard and home garden/gardening	462
Table 8-3. Place experience of Golden Age’s courtyard	468
Table 8-4. Comparison of place experience between Golden Age’s courtyard and home garden/gardening	471
Table 8-5. Place experience of Elderly Living’s courtyard	476
Table 8-6. Comparison of place experience between Elderly Living’s courtyard and home garden /gardening	479
Table 8-7. Shared experiential qualities cross the three courtyards	481

ACKNOWLEDGEMENTS

This study would not have been possible had it not been for the wise guidance of my committee. My deepest gratitude is to my advisor, Dr. Gerald Weisman, who always supports me to explore different possibilities in research on aging and environments. He has a great source of encouragement, insights and humor throughout my doctoral program. I am grateful to Dr. Brian Schermer for his feedback, which made me to go out of thinking box and onto more holistic research. I am much obliged to Dr. Josef Stagg for his support and insights of a mixed research method. I would like to express my sincere thanks to my two readers, Dr. Jeanne Hewitt and Dr. Roger Smith. Their critical review added great value of publishing my study.

I am extremely grateful for the kindness and cooperation of 13 nursing homes that I had visited in my pilot study and dissertation research. Thanks to residents who participate in interviews for their time and patience in telling life stories. Thanks to staff who share their experience regarding delivering outdoor activities to residents.

This effort would not have been possible without the encouragement of my colleagues in the Ph.D. program. Mark Proffitt, Myounghee Jorn, Randy Taylor and Neel Kamal Chapagain have been my best friends and professional consultants. I especially thank Mark Proffitt and Myounghee Jorn, who had supported and cared for me through regular group meetings in my tough time.

The unconditional love and support of my family made this pursuit become possible. In this long academic journey, their encouragement and the way they cared for grandmothers motivate me to continue down this path of environmental gerontology. Finally, I am most grateful to my best friend, Yuri, who has been the greatest listener and supporter. When I faced challenges, she consistently gave me thoughtful advice and cheered me up with her original sense of humor whether I liked it or not.

Thank you so much to all of you.

CHAPTER 1 : INTRODUCTION

A contextualist worldview forms the basis of this dissertation research. Institutional outdoor environments are conceptualized as multifaceted places characterized by intertwining relationships across contexts. Such a concept is reinforced by the needs for dealing with a real-life situation in all different perspectives simultaneously. The following analysis regarding the development of institutional outdoor environments manifests this multivariate thinking. It further suggests that the environments are composed of interactions among physical settings, people and rules of place use.

An outdoor space in care settings can be traced back to the development of medieval courtyards in monasteries. The courtyards had healing purposes; they were used to grow herbs and vegetables for sick monks (Evans, 2014). An infirmary and physician's room were located next to the courtyard, allowing easy access to medical resources. Furthermore, the courtyard has a strong sense of spirituality. It is a place where monks meditate, recite and exercise (Bowe, 2004).

The value of the courtyards declined at the end of Middle Age when community hospitals started to emerge in the 15th century to control miasma-related diseases and provide different health services (Oppert, 1883). Although courtyard space was preserved in the hospital design, the purpose was for better ventilation rather than easy visual and physical access (Atkinson, 2009). One design feature is high-ceiling wards (30 to 40 feet) with small windows above outdoor walkways surrounding a courtyard.

Hospital courtyards regained attention after the 17th century due to the recognition of the importance of the hygienic conditions (Miller & Swensson, 2002). Health was believed to be dependent upon sterile and natural environments with clean air. Pavilion-plan hospitals emerged in this period. A hospital complex usually consisted of separate buildings joined by a single arcade. Courtyards were

located between the wings so patients were exposed to fresh air and the sun (Miller & Swensson, 2002). To maintain hygienic environments, patients were discouraged from bringing personal belongings. Closets were not provided to store personal items because personal items may keep filth (Cook, 2002). The pavilion-plan style prevailed until the 20th century. With advanced building and medical technology, hospitals became multi-floored with clear divisions of departments (Forty, 2003). Interactions of natural environments were replaced by efficient medical services equipped with advanced ventilation systems, devices and instruments (James & Tatton-Brown, 1986).

The United States in the 19th century had almshouses or poor houses providing care for old, disabled and poor people. Architecturally, an almshouse can be a brick, two-floored building or a house built of wood with wooden barns and outhouses (Ibbotson, 2002). Most of the almshouses had farms or vegetable gardens producing a supply of food for the houses; able-bodied residents worked on farms and gardens in exchange for basic support (Cooklis, 1991; Ibbotson, 2002). Almshouses declined in the 1930s due to a lack of quality care and safety (Wunderlich et al., 1996). Nursing homes began to develop after the Social Security Act (SSA) of 1935 and SSA amendments, which provided funding for licensed community-based services (Ibbotson, 2002). In 1954, the Hill-Burton Act funded non-profit organizations to construct nursing facilities that are “in conjunction with a hospital”. Although the act targeted non-profit organizations, it created an expectation that the physical design of nursing homes should closely parallel hospital building standards (ElderWeb, n.d.). Intended outdoor environments caught little attention in constructing hospital-like nursing homes during this period.

The nursing-home design in the 1980s started taking outdoor environments into account. Three major forces may have driven the emergence of outdoor space: 1) the trend of nature-based outdoor recreation starting in the 1960s, 2) the Omnibus Budget Reconciliation Act (OBRA) of 1987 and 3) an attempt to increase the marketing value in competition with other types of long-term care facilities (e.g., assisted-living) after 1986. After World War II, outdoor recreation became a part of the American

lifestyle (Cordell, 2008). Government-initiated studies set aside funding for projects related to outdoor recreation and the use of natural resources from the 1960s to the 1970s, which promoted the awareness of the connection between outdoor learning programs, health and environmental protection from the 1980s to the 1990s. This awareness reflected an attempt to pursue a high quality of life (Jensen & Guthrie, 2006).

At the same time, society started to protest against institutionalized care for nursing home residents with cognitive impairments and behavioral issues. Under increased public pressure, OBRA was passed to “ensure that residents of nursing homes receive quality care that will result in their achieving or maintaining their "highest practicable" physical, mental, and psychosocial well-being” (Klauber & Wright, 2001); nursing home organizations were required to provide care services to emphasize residents’ social, emotional, recreational, cultural and medical needs. The act led to an emphasis on activity programs that have to be directed by qualified professionals (Harper Ice, 2002). A medical model was then gradually replaced by a model with imagery of home, and the design of physical environments attempted to create a home-like atmosphere (Cutler & Kane, 2009). At the end of the 1980s, intended outdoor environments with garden spaces and furnished patios became a popular design feature. In general, these spaces were created to accommodate social activities and to produce a less institutional image (Cohen & Weisman, 1991).

The nursing home market began to shrink with the emergence of assisted living and other care providers in the 1988. Other long-term care service options were encouraged by governments to reduce their nursing home bills (Castle et al., 2007). To become more competitive, facilities renovated the physical space because it is perceived to be one of the indicators of a good quality of life (Cutler et al., 2006; Kane, 2001). In addition to home-like interiors (e.g., a carpeted floor and fireplace), a well-designed courtyard or garden space was considered to be a positive feature. Cohen-Mansfield (2007) conducted a survey of 320 nursing facilities regarding the impact of outdoor areas. Over 70 percent of

the administrators or directors perceived positive benefits from their outdoor spaces, and over 80 percent believed the spaces increase their marketability.

I. Outdoor Environments of Nursing Homes as Place

Based on the above discussion, understanding of institutional outdoor environments has to be made in a holistic way. This study applied systemic place theories to capturing the multifaceted phenomena. Based on these theories, an intended outdoor space was conceptualized as place or a system that comprises different contexts and interactions between them. The center of the system is “place experience”. It is the result of the interactions, representing inclusiveness of different aspects of the environments.

Following the theories, one of the important background contexts is the physical settings, which shape and are shaped by how people perceive and interact with environments. For example, in a monastery, visual and physical access to a courtyard was created to cater to the needs of physical and spiritual health; environments that facilitate collective behavior of interacting with nature may reinforce the healing experience.

Another critical context is the people components that address organizational interests, staff practice and resident’s profile. They influence how space is experienced and utilized. For example, organizational philosophy toward roles and ownership of outdoor environments could shape a courtyard into a backyard-or front-yard like setting. The former is more autonomous and the latter more restrictive. Besides, a staff’s knowledge of the common experience among residents may help plan outdoor activity programs (Neustadt, 1985); activities that enhance past lifestyle may bring familiarity and trigger reminiscence.

Organizational policy and other forms of explicit and implicit rules cannot be overlooked; they represent consensual interpretation of the environments and define appropriateness of outdoor behavior. For instance, to encourage family gatherings, some facilities have more flexibility regarding

outdoor eating; adequate furniture (e.g., chair-and-table sets) and devices (e.g., a grill) are provided to accommodate activities served with food and drink. Residents may feel more at home when cooking and sharing food with family members.

Place experience

Each place has its own place experience due to their distinctive contextual background developed to adapt to local conditions. It is like a “personality” or an “identification mark” indicating uniqueness of a place (Moos, 1981). Place experience is how people feel about a place (Moore et al., 2001). It is direct and congregated experience derived from people’s interactions with overall environments. Place experience connotes a person’s preference, actions and knowledge of a place (Canter, 1991); experiential expression of outdoor settings suggests whether people are satisfied with the environments, whether an action is supported and how well they can retrieve and predict information. Each aspect is a process of evaluation gauging relations between the self and external environments. For example, a sense of safety and security may result from the self-assessment of a low probability of falling.

Residents with cognitive impairments may have difficulties with verbal communication. However, their interaction with physical settings (e.g., gardening on a planting box), with staff (e.g., asking help from staff) and with outdoor rules (e.g., knowing how to request outdoor lunch) may reveal how they feel. Environmental gerontologists or architectural researchers play an important role in decoding the unspoken messages by analyzing their interactions with the environments.

Negotiation of place

The concept of place implies a process of negotiation between different social roles. Negotiation is triggered by conflict perception, understanding, and goals of place use. For example, administrators may perceive a courtyard as a tool to increase marketability; its cleanliness and neatness could produce a good first impression; however, residents may mess up floors during gardening activities. Given limited

staff in maintaining the courtyard, which aspect of the courtyard is compromised? Kiyota (2009) investigated residents' interaction with indoor gardens in a nursing home; conflict goals were disclosed in delivering gardening activities. She pointed out,

“Because most of the residents required some degrees of assistance from staff members, staff members had to understand the needs of residents at the individual level. Many staff members expressed their concern that there was not enough time to help each resident interact with plants, or there were not enough staff members to water plants...organization's objective of introducing plants to elderly residents was utilizing plants as a tool to facilitate the meaningful activities and relationships. However, some staff members did not understand why plants were important for elderly residents in long term care facilities... (pp. 190-191)

The indoor garden space reflects 1) residents' need of functioning support, 2) staff expectation of less responsibility and 3) organization's interests— providing meaningful activities without adding more resources in terms of staffing and education programs. In Kiyota's study, mismatches between the three aspects may affect how residents interact with indoor plants and to some extent impact outcome measures in terms of improvement of depression. In the same vein, conflict goals may influence outdoor behavior and experience. Brawley (2007) noticed an absence of residents in outdoor environments of nursing homes; She described, “There are an abundance of pretty gardens that often improve marketing attempts but rarely seem to interest or engage residents” (p. 275). Similar observations can be found in other studies (e.g., Chalfont & Rodiek, 2005; Cranz & Young, 2006; Kearney & Winterbottom, 2006). To address the problem, Brawley suggested that outdoor environments should be utilized as part of overall therapeutic programs and woven into care plans but most importantly, “developing a strong outdoor

activity program before—not after the garden is designed and built is the foundation that determines how the design can best support activities and ultimately, the residents.”

Consensus of place

Brawley’s approach may not fully solve the issue because only staff and design professionals are involved. Based on systemic place theories, this study argued that consensus among residents, staff and organizations has to be established before a program is launched. Such consensus is the common needs in terms of desired place experience across different social roles. The consensus then leads to the development of function (activity) programming, which guides architectural programming to enhance desired experience. In other words, experiential programming (arrangement according to a plan or schedule of desired place experience) serves as foundation directing development of the other two forms of programming. Current design guidelines (e.g., Marcus & Barnes, 1999) often portray what physical settings ought to be but overlook roles of people components. Following the guidelines, a beautiful courtyard may be created but attract few residents.

II. Impasse of Current Research

There is a contradictory evidence regarding benefits of institutional outdoor environments. Most of studies on institutional outdoor environments applied a positivist worldview using quantitative analysis. Research conducted in healthcare or lab settings shown that viewing nature has a positive and significant impact on health outcomes such as blood pressure, heart rate and days of recovery from a surgery (e.g., Ulrich, 1981; Ulrich et al., 1991). However, research on horticultural therapy and exposure to gardens in long-term care settings suggested a positive trend or partial support of a hypothesis regarding relationships between interactions with nature and outcome variables such as reduction of pain, stress, agitated behavior, and amount of medications (e.g., Calkins et al., 2007b; Detweiler & Warf, 2005; Irvine & Warber, 2002; Ottosson & Grahn, 2005). These studies were often criticized for methodological weaknesses such as small sample size and inadequate control of confounding variables

in randomized controlled trials (Detweiler et al., 2012; Zeisel, 2007). Zeisel (2007) pointed out that concepts of healing gardens are more like a statement of belief due to a lack of rigorous research design. In other words, there are few credible quantitative studies supporting evidence-based design, and it seems necessary to examine existing design guidelines developed based on quantitative findings.

Scholars who conducted descriptive research may not completely agree with Zeisel's statement. Without controlling settings, their studies revealed psychological, cognitive, behavioral and social benefits of institutional outdoor environments (e.g., Cutler & Kane, 2005; MacDonald, 2006); however, little effort has been made to translate their findings into practice.

Besides methodological issues, current quantitative evidence for older adults is quite belated (see Chapter 2). Detweiler et al (2012) called for new research for understanding outdoor space as treatment for aging population; however, if the methodological issues are not solved, development of new knowledge will still go to a dead end. One solution is to put more efforts or develop innovative skills to control different kinds of variables in long-term care settings; at least five types of variables—dependent, independent, contextual, intervening and secondary or side-effect variables—have to be managed in this specific setting (Zeisel, 2007). However, before spending more resources in creating controlled trials, it seems more important to embrace multiplicity and understand variables that exist and may influence quality of activity delivery; the understanding should have implication of practice guiding implementation and evaluation of outdoor projects.

A promising solution

A pragmatic approach incorporated with systemic place theories seems very promising in this study area. Pragmatic knowledge is pattern-based; it is a form of knowledge between relativist and absolutist understanding of the world. The paradigm is described as an epistemological approach of knowing-how (i.e., how to improve and evaluate a program) instead of knowing-why (Polkinghorne, 1992). A pragmatic approach holds a hermeneutic description aiming to reveal patterns of different

contextual variables in practices while allowing scientific effort to “collect, organize and distribute the practices that have produced their intended results”. Scientific research is not used to seek “underlying laws and the truths of the universe” as in a quantitative study (Polkinghorne, 1992, p. 152); it investigates patterns of workability. Successful patterns are organizations of effective actions in particular environments (Polkinghorne, 1992). From the perspective of place theories, they may present an arrangement of desired place experience resulting from people taking action upon the environments. The pattern thinking thus allows this study to address the outdoor environments holistically while identifying certainty. More detailed discussions are provided in Chapter 3.

III. The Purpose of the Study

This study focuses on place and place experience of outdoor environments of nursing homes. Given the above analysis, the goal is to identify different components of the outdoor environments and reveal place experience resulting from the interactions between them.

The study consists of three case studies; the purpose is to show three different types of place experience (see Chapter 8) and their underlying unique interactions between contexts (See Chapter 4, 5 and 6, respectively). Importance of understanding place experience is outlined in Chapter 2, which argues that place experience is an integrative approach to synthesis of existing quantitative and qualitative research. Chapter 3 provides a conceptual framework of place and place experience based on premises of pragmatism and place theories; the framework posited the study in a philosophical middle ground and revealed its pragmatic usefulness in improving practices. Following that a research design is developed; it is characterized by a multiple-method approach and offers a means of translating data that define different contexts into an experiential description (see Chapter 4).

IV. The Significance of the Study

Based upon a pragmatic paradigm, this study would complement current understanding of institutional outdoor environments dominated by a positivist worldview. The paradigm allows co-

existence of different philosophical approaches, creating a holistic description of outdoor environments. A pragmatic approach has been employed to investigate interior environments of long-term care settings (Kaup, 2012; Moore, 2000); this study provided pragmatic analysis of exterior environments, which would aid in understanding of nursing homes as a whole that comprises both indoor and outdoor environments.

Outdoor environments of nursing homes are an ill-defined place; systemic place theories guided this study to identify and describe physical, social and experiential aspects of the environments; understanding what variables exist in different contexts and how they may interact with each other would help future studies with attempts of standardizing performance create rigorous research design. Besides, following the theories, place experience— convergence of people-environments relations— was revealed; its practice implications in terms of evaluation and programming were discussed.

The three cases studies are a starting point of future collection of case reports. Shared qualities across cases would become a foundation for categorizing outdoor environments in different place types such as hospitals, nursing homes, assisted living and senior independent apartments. Common features across relatively successful cases (cases with more desired place experience) suggest workable or effective patterns developed for better adaptation to current social and economic background (i.e., better practice); they may serve as a roadmap guiding improvement of less-than-optimal cases.

CHAPTER 2 : LITERATURE REVIEW

Chapter 1 gave a brief description of the impasse of the current research. This chapter provided more detailed literature review. It discussed underlying reasons for the research deadlock and offered a solution. This review included a total of 44 articles (32 empirical and 12 rational studies), which were obtained through databased search and manual cross-referencing of bibliographies. The databases included PubMed, PscyINFO, Arts & Sciences, Social Science Citation Index (Web of Science) and Google Scholar. Search keywords comprised combination of nursing homes, hospitals, assisted living, independent livings, healthcare settings, long-term care, older adults, outdoor environments, gardens, courtyards, patios, outdoor space, design, architecture, outdoor activity, gardening and outdoor programs. The initial online search produced 68 related articles. After excluding duplicates and articles before 1990, there were 44 studies in the final list. The inclusion criteria extended to quantitative and qualitative empirical research on outdoor environments of healthcare or long-term care settings. Articles of literature review, design recommendation and design evaluation were categorized as rational research. Studies that introduced processes (steps or tools) of horticultural therapy were excluded because there were few descriptions of participants and environments. In addition, studies that introduced cases in non-peer-reviewed design magazines were excluded because they emphasized selection of design materials and construction details.

This collection of research was analyzed in three steps. First, its worldviews was examined based on 1) Altman & Rogoff's framework (Altman & Rogoff, 1987; Neisser, 1976) and 2) Lawton's three functions of environments (Lawton, 1989; Wahl, 2001; Wahl & Weisman, 2003). Second, its theoretical positions were discussed and mapped in development of research on environmental perception, cognition, behavior, affect and meaning. Finally, the previous two steps led to conclusion of

philosophical and theoretical disagreement between studies. An approach was offered to generate consensual knowledge across the studies.

I. Analysis of Paradigm: Need for an Alternative Approach

Kuhn (1970) used the term “paradigm” to describe underlying assumptions and fundamental intellectual structures shared in a field of research. A paradigm is the way of how people explain the world or reality; it is not often open to argument within a community of scholars. A paradigm consists of a set of beliefs shaping development of conceptual frameworks, research methods and interpretation (Creswell & Clark, 2011). Following Altman’s and Lawton’s taxonomy of research assumptions, this study concluded that current knowledge of institutional outdoor environments is mainly shaped by an interactional worldview or a stimulating-based approach.

A. Analysis based on Altman & Rogoff’s taxonomy of worldviews

Altman and Rogoff (1987) argued that research of environmental psychology was mainly based on four worldviews: trait, interactional, organismic and transactional. Based on the principles of the four worldviews, thirty-three reviewed articles (75%) were categorized as interactionalist research, eight articles (17%) as organismic research and two articles (8%) as transactional research (Table 2-1). Domination of an interactional perspective was also found in research on environmental gerontology. Parmelee & Lawton (1990) and Wahl & Weisman (2003) discovered that studies of housing for older adults had been guided by interactionalism.

The interactional worldview conceptualized environments as stimuli, and assumed human like a machine processes stimulation or information in a linear way. Products of processes are behavior and psychological responses, which can be predicted and controlled within manipulated environments. Given the assumption, behavioral or psychological responses are often treated as dependent variables in interactionalist research. In other words, people and environment (P-E) relations are conceptualized as cause-effect relationships. Ulrich’s Stress Reduction Theory is embedded with this antecedent-

consequent link (Ulrich et al., 1991). Ulrich postulated that unconsciously emotional responses are triggered by an initial level of responding to nature. “Depending on the characteristics of a natural setting, and the individual’s preceding affective/cognitive/physiological state, adaptive responses can range from stress and avoidance behavior to restoration and approach behavior (seeking out, staying in, not avoiding)” (p. 208).

Following the same mindset, interactionalist scholars in this research collection treated people and environments as two separate entities. People were conceptualized as predictable psychological responses (e.g., mood and behavior) that can be evoked by an array of stimulus from nature. The unit of analysis in these studies is interactions of people and outdoor environments or natural materials. Rodiek’s (2002) study is an interactionalist example. Rodiek assessed psychological and physiological outcomes associated with natural environments. Her research “measured four variables on the subjects immediately before and after a single session in one of three different randomly assigned conditions” (p. 3). One major feature of this research and other pre-post studies (e.g., Calkins et al., 2007; Mather et al., 1997; Connell et al., 2007) is that people and environments are reduced to few variables; other contextual factors are assumed to be perfectly maintained unchanged until the end of research period.

Table 2-1. Worldviews of the review articles

Worldviews	Conceptualization of P-E relations	Unit of analysis	Authors	# of articles
Trait	<p><u>People</u>: biological basis of a person</p> <p><u>Outdoor Environment</u>: outdoor environments have very little influence on people</p>	Individuals or psychological quality of persons	n/a	0
Interactional	<p><u>People</u>: machine basis of a person with predictable behavior (e.g., agitated behavior), mood (e.g., depression level), psychophysiological indicators (e.g., heart rate), quality of life outcomes (e.g., sleep quality, incident rates)</p> <p><u>Outdoor Environment</u>: natural factors serving as stimulus of psychological and behavioral functioning</p>	<p>Interactions of people and outdoor environments, that is psychological qualities of individuals or outdoor environments treated as two separate underlying entities with interactions between them</p>	<p>Calkins et al (2007a)</p> <p>Jarrott & Gigliotti (2010)</p> <p>Pettigrew & Roberts (2008)</p> <p>Mather et al. (1997)</p> <p>Mooney & Nicell (1992)</p> <p>Connell et al (2007)</p> <p>Detweiler et al (2008)</p> <p>Detweiler et al (2009)</p> <p>Rappe & Kivela (2005)</p> <p>Lee & Kim (2008)</p> <p>Ottosson & Grahm (2005)</p> <p>Rappe & Kivela (2006)</p> <p>Rodiek (2002)</p> <p>Grant & Wineman (2007b)</p> <p>Heath & Gifford (2001)</p> <p>Hussein (2010)</p> <p>Sherman et al (2005)</p> <p>Cohen-Mansfield & Werner (1998a)</p> <p>Sugihara & Evans (2000)</p> <p>Cohen-Mansfield & Werner (1998b)</p> <p>Cranz & Young (2005)</p> <p>Emi Kiyota (2009)</p> <p>Detweiler & Warf (2005)</p> <p>Pachana et al (2003)</p> <p>Lovering et al (2002)</p> <p>Irvine & Warber (2002)</p> <p>Cohen-Mansfield (2004)</p> <p>Bossen (2010)</p> <p>Brawley (2002)</p> <p>Rappe & Topo (2007)</p> <p>Cox et al (2004)</p> <p>Rodiek (2006)</p>	33
Organismic	<p><u>People</u>: a person system with subsystems including stages of disease, functioning ability, life history and goals</p> <p><u>Outdoor Environment</u>: a system consists of several environmental subsystems including physical & natural, organizational and social environments</p>	<p>A whole system composed of separate personal and environmental subsystem</p>	<p>Bengtsson (2006)</p> <p>Hernandez (2007)</p> <p>Cutler & Kane (2005)</p> <p>Kearney & Winterbottom (2006)</p> <p>Bartlett (2007)</p> <p>Zeisel & Tyson (1999)</p> <p>McBride (1999)</p> <p>Ousset et al (1998)</p> <p>Hoover (1995)</p>	9
Transactional	<p><u>People</u>: convergence of identity, emotion and attachment define and are defined by outdoor environments</p> <p><u>Outdoor environments</u>: outdoor environments with organizational, social and physical aspects define and are defined by people</p>	<p>People-in-outdoor environment— a holistic entity composed of people and environments that are mutually defined.</p>	<p>Bartlett (2007)</p> <p>Berg et al (2006)</p>	2

The oversimplification of environments was often criticized by scholars in transactional worldviews. They stood at an opposite side of interactionalism and assumed that people and environments are inseparable and mutually defined entities (Altman & Rogoff, 1987). In other words, they conceptualized all phenomena as P-E convergence. The convergence deals with processes, temporal aspects of people and environments, emotions and attachment, which corresponds to the approach of phenomenological research. An example of this worldview is Tuan's concept of Topophilia (Tuan, 1974). it describes affective bond (sensory experience, action, rootedness and identity) between people and natural environments, reflecting "existential, experiential and holistic concept of the intimate connection of people and places, culture and geography ." (Rodaway, 2010, p. 427)

Only two articles (Bartlett, 2007; Berg et al., 2006) demonstrated a transactional concept in this collection. They applied a phenomenological approach to linkages among action, garden space, personal value and self-identity.

The interactionalist and transactionalist approach, according to Wahl and Weisman (2003), had created a "philosophical tension" (p. 624), reflecting a sharp contrast between objective (scientific) and subjective (experiential) paradigms. To avoid to be caught up into the binary, they suggested that trait and organismic worldviews may be a solution to ease the tension. A trait worldview assumed that "personal qualities are primary determinants of contemporaneous behavior" (Altman & Rogoff, p. 12); environments have little influence on psychological qualities of individuals. Although no reviewed article is associated with this approach, there is a potential example —Gitlin's research on older adults' home modification (1998; 2000) —presented in Wahl & Weisman's (2003) study. Gitlin conducted several empirical studies on older home dwellers and their behavior of home modification. She found that house modification is associated with characteristics of home dwellers including social-economic status, gender, disability, and personality (e.g., control/self-efficacy, emotional stability or level of anxiety and depression); however, as Gitlin mentioned, very few studies applied psycho-social mechanism to

explaining home environmental intervention (Gitlin, 2003). She thus called for more studies to fill the knowledge gap, and suggested an integration of “ground up” concepts (e.g., quality of life, symbolic meanings, and personal life style) in a behavior-oriented framework so understanding of adaption of home environments can be more holistic.

An organismic or systemic approach is viewed as a synthetic approach (Wahl & Weisman, 2003). In this paradigm, a phenomenon is conceptualized as a system that comprises person and environment subsystems as well as their interactions; its underlying assumption is that the whole “permits a better understanding of its parts and of the relation of the parts to the whole.” (Altman & Rogoff, 1987, p. 19) Like an interactional approach, it describes P-E relationships as interactions of separated entities. Similar with a transactional approach, it contextualizes psychological processes and seeks to understand complex relationships as a whole. Therefore, a systemic approach is taken as a middle ground between interactionalism and transactionalism. Moos’s (Moos, 1981) study on social climate is an example of a systemic approach (Wahl and Weisman, 2003). His conceptual model contains environmental variables (architecture, organizational, and social factors), person variables (personal and aggregated residents and staff characteristics) and interactions between them. Social climate is a result of interactions among these elements, which represents an inclusive concept of P-E relations.

Nine reviewed articles (six empirical and three rational studies) are embedded with a systemic concept. For example, Hernandez (2007) applied a case-study research method to exploring relationships between architectural, psychological, social and organizational aspects of outdoor environments in special care units. Results of interactions among these aspects were transformed into several residents’ “good” or “positive” feelings and experience of outdoor environments. Scholars such as Bengtsson (2006), Cutler & Kane (2005) and Kearney & Winterbottom (2005) followed a similar path, presenting an approach that conceptualizes outdoor environments as a system and revealing desired patterns of interactions among different environments.

Altman & Rogoff (1987) pointed out that “none of these world views provides the “best” or “correct” approach. They simply result in different forms of inquiry, understanding, and theory”. However, it is obvious that our contemporary knowledge of institutional outdoor environments is shaped by a single perspective. Fishman (1999, p. 284) argued that “no one paradigm has a privileged access to the truth.” In this regard, co-existence of different paradigms becomes so important because it allows us to come closer to the truth. Werner, Altman and other scholars (Altman et al., 1987; Oxley et al., 1986; Werner et al., 1987) called for more attention to a transactional approach, and Wahl & Weisman (2003) encouraged scholars of environmental gerontology to apply a systemic approach. This dissertation research attempts to complement current knowledge while seeking to go beyond the subjective-objective binary. A systemic approach seems promising for understanding phenomena of institutional outdoor environments.

B. Analysis based on Lawton’s taxonomy of functions of environments

The above analysis reflected philosophical tendency of the reviewed studies but showed little information about what aspect of outdoor environments is being studied. The gap can be filled with analysis using Lawton’s (1989) taxonomy of functions of environments. The taxonomy was applied in studies of Wahl (2001) and Wahl & Weisman (2003) to understanding underlying assumptions of research on environmental gerontology. Wahl & Weisman (2003) divided articles based on Lawton’s three functions of environments: maintaining, stimulating and supporting, and pointed out their empirical and theoretical inadequacy.

Following them, the 44 reviewed articles were grouped based on the three functions. Thirty-two articles were identified as stimulating-oriented, 11 articles as maintaining-oriented and one article as supporting-oriented. Six articles contained discussion of both stimulating and supporting functions (Table 2-2). Maintaining functions of environments were referred to as “the normal state of affairs for the person in relation to his residential environment” (Lawton, 1989). Lawton further explained,

“Everyday life is composed of a series of repetitive, well-practiced behaviors in relation to the environment. Waking up, getting out of bed, going to the bathroom, getting the morning paper...each component is very likely to be taken for granted, sometimes to the extreme that the environment is out of one’s consciousness during such behaviors.” (p. 37) Maintenance thus reflects concepts of continuity, predictability, constancy and familiarity. It is concerned with questions of who I am, what I do, where I stand and how I make it. Studies in this research collection that emphasized personal identity, continuity of self and sense of personal usefulness in outdoor environments are viewed as supporting-based.

Stimulating functions are related to “the state experienced by the person when the environment comes into consciousness because some response is required by the person...” (p. 37). The responses include emotional, cognitive or behavior reaction to a stimulating environment. In this collection, research with topics of psychological responses evoked by outdoor environments is treated as stimulating-based.

Supporting functions are related to a state “experienced by the person when the environment comes into consciousness by virtue of its affording some relaxation of demand for response.” (p. 11) It is concerned with reduction of environmental demands in carrying out daily activities. Research with a focus on this aspect of outdoor environments is viewed as supporting-based.

Table 2-2. Groupings of the reviewed article based on Lawton’s taxonomy

	Maintaining	Stimulating	Supporting	Stimulating and supporting
# of articles	11	26	1	6

1. Research on Maintaining Functions of Environments

Lawton’s concept of maintenance highlights importance of self-identity and continuity. Wahl (2001) associated it with two types of research on institutional environments: 1) research addressing meanings of institutional home, continuity of self after relocation, and subjective interpretation of wellbeing and quality of life (e.g., Gubrium, 1975 cited in Wahl, 2001), and 2) research pursuing

“therapeutic goals” for institutional environments, and generating “better patterns” of environmental configuration for people with dementia (e.g., Cohen & Weisman, 1991; Regnier & Pynoos, 1992, both cited in Wahl, 2001) In this research collection, two studies (Bartlett, 2007; Berg et al., 2006) discussed meanings and personal values related to outdoor environments, and nine (e.g., Kiyota, 2009 ; Cutler & Kane, 2005; Kearney & Winterbottom, 2005) explore qualities of therapeutic outdoor environments. Table 2-3 lists their research questions and findings.

1) Meaning, continuity and selfhood

Applying a phenomenological approach, Berg et al (2006) described older hospitalized patients’ experiences of health. Their findings suggested that health is interpreted as “being able to be the person I am, to do what I want to do and feel well and have strength” (p. 25). In other words, gardening is an action of caring for others and caring for a place in which place attachment, life history, identity and social roles are ingrained. Berg further explained that gardening and carrying house chores are processes of self-confirmation, which reassure “that I am able to be the person I am, used to be, a living person and also a significant person” (p.31) and then shape experience of wellbeing. Based on the study, “health” is intertwined with identity, action and continuity of self.

Bartlett (2007) explored how a man’s quality of life is reduced after relocation to a nursing home. He found his research participant (a male resident) suffers from boredom and loneliness because of loss of control over his economy, activity space and emotional attachment. From Bartlett’s perspective, the man is excluded; he is not able to spent money, go to his favorite bar, dig soil, grow food he like, and contact with friends. The current institutional home offered no familiar activities, and the man misses his life, home and home garden very much. That means his identity as a husband, father, gardener and factory worker faded away in experience of exclusion. Coping strategies applied by the participant was to align himself with other male residents, and align himself with masculine behavior—watching sport channels—the most available activity in nursing homes to reconstruct his identity. Bartlett concluded

that nursing home settings should provide different opportunities that allow residents to capture feeling of being oneself and feeling of at-homeness. These activities are important aspects of wellbeing and experience of autonomy, self-identity and emotional attachment.

2) Therapeutic goals

Eight studies (e.g., Bengtsson & Carlsson, 2006; Hernandez, 2007; Cutler & Kane, 2005; Kearney & Winterbottom, 2005) applied case-study methodology to exploring positive experience of outdoor environments and viewed the experience as goals of future improvement.

Starting from observation and interviews with people, these studies investigated what “good” experiential attributes of environments may be. Their description of experiential attributes was usually coded into themes. Each theme, as shown in Table 2-3, suggested results of interactions between physical, social and organizational environments. For example, themes related to free access were addressed by Hernandez (2007), Cutler & Kane (2005) and McBride (1999). They portrayed the experiential theme as a positive state experienced by long-term care residents when 1) autonomous outdoor visits are allowed, 2) organizational policy and staff attitude support such behavior, and 3) physical settings support functioning abilities. Experience of free access thus represents convergence between people and different dimensions of outdoor environments. Themes related to awareness of spatial and activity information were addressed by Kearney & Winterbottom (2005), Zeisel & Tyson (1999), McBride (1999) and Hoover (1995). They were described as experience shaped by 1) legible physical configuration and familiar landscape elements, 2) staff knowledge in utilizing natural resources in activity programs, 3) staff understanding of leisure preference among residents and 4) available information regarding daily life activities (e.g., menu, activity schedule and doctor’s appointment). Experience of awareness is thus results of interactions of physical, social and organizational environments that collectively address efficient delivery and communication of information.

Besides these two themes, Table 2-3 reveals other common themes exist across the studies. Attributes such as independence, sensual pleasure, safety, familiarity, free and easy access and socialization were constantly emphasized. Results of these studies covered different dimensions of environments and confirmed what has been highlighted in research on stimulating (e.g., sensory stimulation) and supporting functions of environments (e.g., personal identity).

The eight studies often ended with conceptualization of successful outdoor environments (or a healing garden). A model or a framework was presented to express rather than suppress a complicated and multifaceted P-E relationship. Although their studies may be subject to criticism for never being empirically tested (cf., Wahl, 2001), their attempt of seeking ecological validity is evident.

Table 2-3. *Maintaining-based studies*

Authors	Research Questions	Related theory	Findings
Bengtsson (2006)	Method		
	What kind of experience is related to outdoor environments of nursing homes? Multiple case studies with staff focus groups	<ul style="list-style-type: none"> • Kaplan's Attention Restoration Theory (ART) • Ulrich's Stress Reduction Theory 	<p><u>Theme #1: being comfortable in the outdoor environment:</u> Importance of security and safety and protection from environmental stressor</p> <p><u>Sub-themes:</u> sensitivity to weather, security, familiarity, calmness</p> <p><u>Theme #2: access to surrounding life:</u> Easy access to quality sensory stimulation and pleasant environments</p> <p><u>Sub-themes:</u> capacity for outdoor activity, sensual pleasure of nature, following the rhythm of life in nature, surroundings as a way to keep up to date, surroundings as a source to relate to past times, Social potential of outdoor environments</p>
Hernandez (2007)	What potential do gardens in a special care unit have to maintain quality of life and continuity of past		<p><u>Theme #1: therapeutic activity:</u> Opportunities of engagement in different level of activities</p> <p><u>Sub-themes:</u> social interactions, rituals, continuity of past hobbies, therapy, optimal sensory stimulation</p> <p><u>Theme #2: weather concerns:</u> Importance of protected and sheltered gardens to maintain safety and security and to maximize time of garden use</p> <p><u>Theme #3: free access:</u> Solving conflict between organizational policy and resident needs for independent garden use</p>
	Multiple case studies with resident interview, observation and field notes		
Cutler & Kane (2005)	What kind of experience is related to outdoor environments of nursing homes?	<ul style="list-style-type: none"> • Lawton's Competence-Press Theory • Kaplan's Attention Restoration Theory (ART) • Ulrich's Stress Reduction Theory • Maslow's Hierarchy of Basic Human Needs 	<p><u>Theme #1: free access to outdoor environments:</u> Residents are able to use outdoor space independently and spontaneously without asking permission.</p> <p><u>Theme #2: safe and covered outdoor space:</u> Available seats allow a brief break and rest when using the garden. Seats in the shade may prevent residents from getting sunburn or rain.</p> <p><u>Theme #3: accessible outdoor path:</u> Hard surface walking paths allow wheelchair users to navigate the space without difficulty. Location and distance proximity of an outdoor space also influence its accessibility.</p> <p><u>Theme #4: not a weather-influenced outdoor space:</u> A transitional area between indoor and outdoor environments allows residents to view outdoor scenes in cold winter and hot summer. It also allows residents who prefer to stay inside to watch on-going activities and outdoor landscape. Some shading device or covers in gardens allow residents to adjust micro-climate conditions and find an appropriate sun/shade or hot/cold ratio.</p> <p><u>Theme #5: a private garden:</u> Outdoor space should keep certain distance from household windows so outdoor users feel no invasion of privacy.</p> <p><u>Theme #6: an interesting garden:</u> Outdoor space should have something interesting to allow resident to explore. Wild animals, flowering plants or beautiful sky are good material to prevent outdoor space from being boring.</p>
	Multiple case studies with surveys, checklists, interviews, observation		

Kearney & Winterbottom (2005)	<p>Are nursing home garden able to provide benefit for residents?</p> <p>What outdoor features would achieve fit between environments and long-term care residents?</p> <p>Multiple case studies with surveys and interviews</p>	<ul style="list-style-type: none"> • Kaplan's Attention Restoration Theory (ART) • Ulrich's Stress Reduction Theory 	<p><u>Theme #1: strength support:</u> Residents who lack mobility need staff assistance in using the garden. Insufficient staff help prevent them from using outdoor space. Some gardens are far away from resident households. Multiple entries should be created to reduce physical effort spent on travelling between indoor and outdoor space. A threshold or heavy door should be avoided.</p> <p><u>Theme #2: outdoor views from the insides:</u> For residents who prefer to stay in the building, views of garden plants, wild animals and on-going activity are preferred.</p> <p><u>Theme #3: decentralized garden space:</u> Instead a central courtyard, several smaller garden spaces distributed throughout the building may save resident energy in navigation and prevent disorientation.</p> <p><u>Theme #4: awareness of garden information:</u> Increase of staff awareness of garden resource and benefits may encourage staff assistance in helping residents to use outdoor space and develop outdoor activity program.</p> <p><u>Theme #5: safe outdoor space:</u> Smooth paths with hard surfaces facilitate wheelchair movement. Frequent seating opportunities and handrails ensure safe use for people with limited endurance. Legibility of circulation and visual access to entries and exits reduce confusion for users who suffer dementia, memory loss or anxiety. Shelter from rain, sun and cold weather may encourage residents who are sensitive to the weather to use the garden.</p> <p><u>Theme #6: smoothing sensory stimulation:</u> Provision of visual variety, aroma and auditory interests is critical for people who have physical limitation in gardening.</p> <p>Themes related to outdoor gardens:</p> <p><u>Theme #1: participation in activities that enhance self-hood and social identity:</u></p> <p>Sub-themes: 1) providing activities that are familiar and enhance past social roles; 2) providing prosthetic environments enable residents to participate in activities corresponding to self-identity (e.g., fixing things; digging, making something from scratch); 3) increasing staff's awareness of resident needs and life history</p> <p><u>Theme #1: active and meaningful activities:</u></p> <p>Sub-themes: 1) providing opportunities of active interactions with environments, which enhances past social roles; 2) strengthening nurses' knowledge and approach to understand the complex needs of older hospitalized patients; 3) providing encouragement of being active</p> <p><u>Theme #2: staff knowledge and awareness:</u> Organizations provide training and education for information and knowledge required in programming familiar and meaningful activities</p> <p><u>Theme #3: strength support:</u> Environments offered by organizations provide support of functioning ability required in carrying out familiar and meaningful activities</p> <p><u>Theme #1: security:</u> Enclosed outdoor space with locked gates</p> <p><u>Theme #2: orientation and way-finding:</u> Paths with landmarks leading to meaningful destinations</p> <p><u>Theme #3: places for activities:</u> Wheelchair accessible patio for activities</p> <p><u>Theme #4: paths for walking:</u> Pathways and shortcuts for different types of walking</p> <p><u>Theme #5: locations for cultural memories:</u> Familiar space (e.g., porches) and artifacts (e.g., hand pumps, clotheslines)</p> <p><u>Theme #6: adjacencies:</u> A furnished and protected niched areas with physical and visual access to outdoor space</p> <p><u>Theme #7: familiar daily life activities:</u> Setting a picnic table, feeding birds, watering plants, sitting in the sun, preparing a meal are familiar daily activities. They help to retrieve memory of past life experience.</p>
Bartlett (2007)	<p>How is (is not) continuity of self in terms of social roles, social network and identity maintained in nursing homes?</p> <p>Phenomenology</p>		
Berg et al (2006)	<p>What potential do hospitals have to maintain wellbeing and selfhood?</p> <p>Phenomenology</p>		
Zeisel & Tyson (1999)	<p>What are therapeutic goals of outdoor environments?</p> <p>Multiple case studies with qualitative post-occupancy evaluation</p>		

<p>McBride (1999)</p>	<p>What are therapeutic goals of outdoor environments?</p> <p>Multiple case studies with qualitative post-occupancy evaluation</p>	<p><u>Theme #1: a familiar garden:</u> Colorful flowers, lawn, comfortable chairs and small scale gardens remind home gardens. Staff and designers need to understand life history of residents to construct a garden in a way residents are familiar with.</p> <p><u>Theme #2: privacy:</u> Privacy contributes to social interactions. It can be increased by using landscape elements to reduce visual access into space. Sense of privacy is enhanced by allowing residents to control unwanted auditory stimulation. A quiet place away from its building or mainstream may reduce the impact of noise. Movable furniture allowing creates closeness also help increase privacy.</p> <p><u>Theme # 3: sensory stimulation:</u> Positive sensory stimulation can be obtained through manipulating natural objects and observing seasonal changes. Activity and movement in nature such as water features, animal movement or interactive sculptures can also evoke similar quality. Plant materials should create visual, tactile, olfactory experience.</p> <p><u>Theme #4: accessible garden:</u> Interesting landscape or features should not be placed too far away from each other. Shorter intervals allow people who walk slowly enjoy more variety scenes.</p> <p><u>Theme #5: a garden for increasing mental awareness:</u> Plant selection can provide seasonal highlights, which reminds residents of the season and time. Clear and definite paving patterns define paths, sections and destination.</p> <p><u>Theme #6: places for social interactions:</u> A variety of place is provided for being along and group gathering. Flexible furniture allows creation of small spaces for social gathering.</p> <p>Space for outdoor activities: provision of patio space for group exercise and therapy and space for previewing ongoing activities</p> <p><u>Theme #6: Sense of security:</u> Outdoor space should be visible from nurse station, hallway or offices. An enclosed garden space is necessary to prevent unwanted invasion.</p> <p><u>Theme #7: A comfortable place:</u> Toilets are near garden space. Sun, rain and wind protection device and structures should be placed. Signs indicate temperature or open/close information should be placed at a wheelchair high level. Surface material should not create glaring.</p> <p><u>Theme #8: Transitional space:</u> A furnished and protected niched areas with physical and visual access to outdoor space</p>
<p>Hoover (1995)</p>	<p>What are therapeutic goals of outdoor environments?</p> <p>Single case study with dementia (Cohen & Weisman, 1991)</p>	<p><u>Theme #1: Safety and security:</u> Safe features encourage use of outdoor space but design has to get balance between uncertainty and stability</p> <p><u>Theme #2: Wayfinding and disorientation:</u> Garden design reinforces ability to exercise freedom of movement without feelings of confusion.</p> <p><u>Theme #3: Nontoxic plantings:</u> Selection of plants based on stages of dementia</p> <p><u>Theme #4: Sensory stimulation:</u> Stimulation without stress</p>

2. Research on Stimulating Functions of Environments

Research on stimulating functions of outdoor environments comprised two directions. First, it seeks cause-effect relationships between natural environments and affective response or behavior, and second, it attempts to define user preference in relation to landscape elements.

1) Cause-effect relationships

Scholars (e.g., Calkins et al., Detweiler et al., 2008) in this direction were often influenced by research on non-pharmaceutical interventions of challenging behavior, in which outdoor environments are thought to hold promise for improving mood and reducing agitation and wandering (e.g., Cohen-Mansfield, 2004; Kovach, 2000). Calkins et al (2007) explored impacts of increased time outdoors on agitation and affect among nursing home residents with dementia. Seventeen nursing home residents participated in a quasi-experiment study. Actigraphy was applied to measure agitation and affect in summer and winter time. Their results showed increased time of outdoor visits produced a significant improvement of “pleasure”, “anxiety” and “no emotion” but suggested no significant change of “anger”, “sadness” and “alertness” ratings. Results of impacts on agitation were mixed or need-to-be-interpreted; people had less grabbing and noise-making and fewer requests for attention during the day but more requests for attention at night. Several methodological issues such as a small sample size, inaccurate data collection device and low reliability of data collectors (staff members) were discussed.

Detweiler et al (2008) investigated effects of garden use on inappropriate behavior and intake of psychiatric medications. Thirty-four male residents were observed for 12 months before and after a garden was installed. Results suggested a trend between frequency of garden use and 1) agitation; 2) incident reports; 3) the amount of needed medications; residents who visited the garden more often had fewer agitation-related problems and less amount of medication than those at their baseline phase. On the contrary, physical incidents increased. Cofounding factors that may intervene in the study were

reviewed including data collectors (activity staff), weather factors and barriers of garden access (lighting, locked doors).

Other studies (e.g., Connell et al., 2007; Mooney & Nicell, 1992; Ottosson & Grahn, 2005; Rodiek, 2002) presented similar research questions and design. Table 2-5 lists all the empirical studies in this collection. They usually had a small number of participants (fewer than 30) and research results that only moderately supported hypothesis. Hypothesis-testing results listed in Table 2-5 was summarized in Table 2-4. Only three articles had significant results, suggesting that most of the scholars were struggling for controlling confounding variables and making their evidence more convincing.

Table 2-4. Results of hypothesis testing among the stimulating-based studies

	Results fully support hypothesis	Result partially support hypothesis	Results do not support hypothesis	Total
# of articles	3	10	4	17

Table 2-5. Stimulating-based studies

Results fully support hypothesis ●			Result partially support hypothesis ●		Results do not support hypothesis ○		Support of hypothesis
Reference	Objectives	Theory	# of Participants	Results			
Calkins et al (2007)	To explore the impact of increased time outdoors on sleep and agitation through before-and-after trial	<ul style="list-style-type: none"> Ulrich's Stress Reduction Theory Theory of circadian rhythms 	17	<ul style="list-style-type: none"> Significant improvement of "pleasure", "anxiety" and "no emotion" but no significant change of "anger", "sadness" and "alertness" ratings from baseline values Mixed or need-to-be-interpreted impact on agitation Significant reductions in trespassing from baseline values 	●		●
Cohen-Mansfield & Werner (1998)	To assess the effects of an enhanced environment on the behavior and mood through before-and-after trial	<ul style="list-style-type: none"> Lawton's Competence-Press Theory; Hall & Buckwalter's Progressively Lowered Stress Threshold Model 	12	<ul style="list-style-type: none"> A trend of reducing pacing and exit-seeking Significant increase of pleasure and interest and reductions in anxiety from baseline values A trend of reducing depression and anger No statistically significant differences from baseline values in pacing behavior A trend of decreasing for most types of agitation Significant increase of pleasure from baseline values No statistically significant differences of confusion from baseline values 	●		●
Cohen-Mansfield & Werner (1998)	To assess the effects of outdoor visits on the pacing behavior and mood through before-and-after trial	<ul style="list-style-type: none"> Lawton's Competence-Press Theory; Hall & Buckwalter's Progressively Lowered Stress Threshold Model 	27	<ul style="list-style-type: none"> A trend of decreasing for most types of agitation Significant increase of pleasure from baseline values No statistically significant differences of confusion from baseline values A trend of decrease of disruptive behavior but no significant difference for pre-post outdoor use 	○		○
Mather et al (1997)	To assess the effects of a walled garden on challenging behavior through before-and-after trial	n/a	10	<ul style="list-style-type: none"> Mixed or need-to-be-interpreted impact on violence, falls and all other incidents among units with specialized gardens, outdoor area, and no garden 	○		○
Mooney & Nicell (1992)	To understand the effects of specialized outdoor space on fall and other incidents rate in special care units through case study research	<ul style="list-style-type: none"> Lawton's Competence-Press Theory; 	5 units	<ul style="list-style-type: none"> Outdoor activity group experienced significant improvements in maximum sleep duration from baseline value There was a significant improvement in verbal agitation in outdoor activity from baseline value No significant improvement in physical agitation and aggression 	●		●
Connell et al (2007)	To understand the effects of an outdoor activity program on sleep and behavior in nursing home residents with dementia through quasi-experiment, pre/post-test study	<ul style="list-style-type: none"> Lawton's Competence-Press Theory; Hall & Buckwalter's Progressively Lowered Stress Threshold Model 	20	<ul style="list-style-type: none"> Final agitation scores and total medication employed were lower than baseline values with a trend for residents who used the garden more often Verbal inappropriate behaviors did not change significantly whereas physical incidents increased. 	●		●
Detweiler et al (2008)	To understand the effects of garden use on inappropriate behavior and psychiatric medications through quasi-experiment, pre/post-test study	<ul style="list-style-type: none"> Lawton's Competence-Press Theory; Hall & Buckwalter's Progressively Lowered Stress Threshold Model 	29				

Detweiler et al (2009)	To explore the impact of increased frequency of garden visits on fall and psychiatric medications through quasi-experiment, pre/post-test study	<ul style="list-style-type: none"> Lawton's Competence-Press Theory; Hall & Buckwalter's Progressively Lowered Stress Threshold Model Ulrich's Stress Reduction Theory 	28	<ul style="list-style-type: none"> High wander garden user groups had a significant reduction scheduled medication. High wander garden user groups had a statistically significant reduction in falls compared to low wander garden user groups 	●
Rappe & Kivela (2005)	To understand effects of garden visits on depression in long-term care residents through before-and-after study	<ul style="list-style-type: none"> Ulrich's Stress Reduction Theory 	30	<ul style="list-style-type: none"> A tendency that affective effects of visiting garden space tended to be more pronounced among the depressed than among those not depressed. For both depressed and non-depressed residents, visiting the garden improved mood, quality of sleep and ability of concentration according to their self-rating report 	○
Lee & Kim (2008)	To examine effects of gardening on sleep, behavior and cognition through before-and-after trial	<ul style="list-style-type: none"> Circadian-related theory Physical-activity related theory 	23	<ul style="list-style-type: none"> Cognition was significantly improved after indoor gardening Agitation was significantly decreased after indoor gardening Significant improvement in wake after sleep onset, nap, nocturnal sleep time and nocturnal sleep efficiency was found after indoor gardening 	●
Ottosson & Grahm (2005)	To understand effects of outdoor garden areas on stress through before-and-after trial	<ul style="list-style-type: none"> Ulrich's Stress Reduction Theory 	15	<ul style="list-style-type: none"> Blood pressure is not significantly improved after outdoor visits. Heart rate, rate pressure and pulse pressure is not significantly improved after outdoor visits 	○
Rappe & Kivela (2006)	To assess effects of outdoor visits on self-rated health through a correlational study	<ul style="list-style-type: none"> Circadian-related theory Physical-activity related theory 	45	<ul style="list-style-type: none"> Reported frequency of visiting outdoors had a strong positive effect on self-rated health when adjusting for energy level, sleep, pain, emotional reactions, social isolation and physical mobility 	●
Rodiek (2002)	To explore effects of an outdoor garden on mood and stress through before-and-after trail	<ul style="list-style-type: none"> Kaplan's Attention Restoration Theory (ART) Ulrich's Stress Reduction Theory 	17	<ul style="list-style-type: none"> No significant change in mood or anxiety level Significant improvement of Cortisol (stress level) after using outdoor environments 	●
Cox et al (2004)	To understand effects of gardens on affective responses of older adults with dementia through a crossover, quasi-experimental study	n/a	24	<ul style="list-style-type: none"> Significant improvement of contentment and pleasure after using garden space No significant difference of affective improvement among living room, garden and Snoezelen users 	●

Emi Kiyota (2009)	To examine the effects of interactions with nature on perceived sense of restoration and helplessness through randomly assigned experiment study	<ul style="list-style-type: none"> • Kaplan's Attention Restoration Theory (ART) • Ulrich's Stress Reduction Theory • Seligman's learned helplessness (1976) 	29	<ul style="list-style-type: none"> • Caring for nature is significantly associated with improvement of sense of restoration and depression • Observation of nature shows significant improvement of depression but not sense of restoration. 	●
Jarrott & Gigliotti (2010)	To understand effects of gardening on affects and active engagement through randomly assigned experiment study	<ul style="list-style-type: none"> • Lawton's Competence-Press Theory 	75 in the treatment group and 54 in the comparison group	<ul style="list-style-type: none"> • No difference on affective responses between two groups • The treatment group (Horticultural therapy group) is more likely to be passively engaged and also more likely to be engaged in an activity other than the gardening activities; the comparison group (transitional activity group) is more likely to have repetitive or self-stimulating behavior 	●
Sugihara & Evans (2000)	To examine the role of physical features (proximity of outdoor garden space) in a retirement community in fostering place attachment and socially supportive networks among a group of new residents by a survey	n/a	67	<ul style="list-style-type: none"> • Place attachment can be predicted by proximity to outdoor gardening space from households (significant correlation) • Social support cannot be predicted by proximity to outdoor gardening space 	●

The lack of rigorous research to some extent disallows evidence-based design. Zeisel (2007) argued that a healing garden “is more a statement of belief than one with an evidence base...there is little rigorous research evidence.” (p. 145) He further explained that research on institutional outdoor environments that takes a cause-effect evaluation model has to identify or control five types of variables: independent variables, contextual variables, intervening variables, dependent variables, and side-effect variables. These variables interact with each other, creating difficulty of conducting randomized controlled experiments or quasi-experiments in long-term care settings.

2) Preference of landscape elements

Research on preference of outdoor environments was usually initiated by issues of a low visit rate of outdoor environments. A low visit rate was interpreted in a twofold manner. First, scholars assumed the under-utilization issues are related to unattractive outdoor space; understanding what attracts users and triggers visiting behavior helps solve the problems, and second, they associated the issues with non-supportive environments so understanding what impedes and enables outdoor behavior becomes one of major research goals. The second part is related to supportive functions of environments, and will be discussed in the next section.

Cohen-Mansfield (2007) surveyed utilization of outdoor environments in 320 long-term care facilities. Data reported by staff showed that approximately 62 percent of the facilities have outdoor space that is not fully utilized. Utilization of outdoor space is related to accessibility of natural materials for sensory experience. That means a preferred outdoor space from staff’s perspective is characterized by combination of lower environmental demands and sensory stimulation (e.g., automatic door, wheelchair-accessible raised beds).

Rodiek (2006) conducted surveys and focus groups in 14 assisted living facilities. One of her research purposes is to identify which landscape elements residents perceived as attractants. Her

hypothesis is that there are specific environmental features serving as magnets, attracting outdoor users.

Table 2-6 lists all “magnets” of built and natural features identified in Rodiek’s study.

Table 2-6. Features listed as attractants to outdoor usage by Rodiek (2006)

Preferred features of built environment	Preferred features of natural environment
Overhead shelter	Greenery
Sitting areas	Fresh air
Porches	Flowers
Gazebos	Birds
Walking loop	Water features
Swings	Other nature elements
Indoor features	Sunshine
	Animals

Although Rodiek gave little explanation of why these elements draw people to go, there was some information allowing readers to make speculation. In her study, resident’s expression of preference often comes with descriptions of accessibility and comfortable levels. Features that lack these qualities may not be perceived as attractants. Similar concepts can be found in Cohen-Mansfield’s analysis (2007), suggesting that preference of institutional outdoor environments may be shaped by results of how people interact with furniture or landscape elements.

Rodiek’s study also revealed some potential topics that have not been fully discussed in current research. First, it showed that assisted living residents appreciated both sunshine and shade. The seemingly paradoxical expression implies needs of control and choice regarding regulation of physical comfort in responding to local weather conditions; in other words, experience of freely selecting sunny and shaded seats may associate with outdoor visits. Second, natural elements such as “birds” and “flowers” imply affordance of both active and passive interactions with nature. Residents may like observation of plants and animals and also appreciate potential opportunities of “doing something” — feeding birds, weeding, watering, digging and deadheading; these are familiar activities residents used to have in the past. In a word, attractive outdoor environments may be linked with a sense of familiarity and experience of being able to take actions.

To conclude Rodiek's study, it is worth understanding what element attracts attention but it is also critical to know what potential desired experience is shaped by these features and associated with outdoor behavior.

3. Research on Supportive Functions of Environments

According to Wahl & Weisman (2003), this research topic is guided by Lawton and Nahemow's Competence-Press Model (Lawton & Nahemow, 1973) and Lindsley's (1964) concept of prosthetic environments. A major purpose of the research is to address compensation for loss in competence through supportive architectural features (Wahl, 2001, p. 244). In this research collection, scholars who are interested in supportive outdoor environments assumed an association between low utilization and inadequacy of outdoor support. Their studies are often descriptive with findings coded into themes (e.g., Grant & Wineman, 2007; Cranz & Young, 2006; Rodeik, 2006; Cohen-Mansfield, 2007) (Table 2-8).

One major assumption in Sherman's (Sherman et al., 2006) study is that distance between patient rooms and hospital gardens determines outdoor usage. They made comparison of visit rates among three outdoor gardens in a hospital. Findings suggested that a garden with relatively direct and easy access had a significantly high visit rate. However, the study gave little information regarding spatial configuration and user characteristics; it is unclear whether other environmental and individual factors also influence visit frequency. In Rodiek's (2006) study, barriers perceived by assisted living residents were grouped into non-accessibility and accessibility issues (Table 2-7). The groupings revealed two important themes are worth discussing. First, the groupings contained both "experiential barriers" (e.g., sense of safety) and "physical barriers" (e.g., problems with sidewalks) but little explanation was provided about juxtaposition of the two different contexts (experiential and objective contexts). Second, "physical configuration of elements" (Table 2-7) may suggest issues of cognitive access to environments related to wayfinding and spatial orientation; however, there was little discussion regarding features of cognitive support in the study.

Table 2-7. Perceived outdoor barriers listed by Rodiek (2006)

Barriers related to non-accessibility issues	Barriers related to accessibility issues
Physical configuration of elements	Problems w/sidewalks
Safety/security concerns	Problems w/doors
Insects and/or climate conditions	Wheelchair usage
Lack of interesting features	Distance (too far)

Grant & Wineman (2007) explored a more complicated concept of “support” through their research on five continuing care communities. According to data of observation and interviews, they found there are several dimensions of supportive environments. For example, garden furniture may accommodate independent and spontaneous individual and group activities. Organizational policies may encourage independence. Staff’s attitudes toward free access and autonomy could help self-initiative outdoor visits. In other words, they argued outdoor usage depends on supportive physical environments, social and organizational environments. They further built a “garden-use model” to conceptualize the multifaceted environments (Figure 2-1). In the model, barriers regarding 1) organizational policy, 2) staff attitudes, 3) visibility, 4) physical access, and 5) garden design are viewed as environmental stress. To reduce the stress, there are five corresponding environmental interventions to compensate resident abilities and achieve “optimal encouragement of residents’ use of outdoors” (p. 109). This model is embedded with the spirit of Lawton and Nahemow’s Competence-Press Model, aiming to lower environmental press. One issue is that resident characteristics in terms of functioning abilities are not addressed in the model, which to some extent understates Lawton’s attempt of emphasizing interactions between people’s competence and environments.

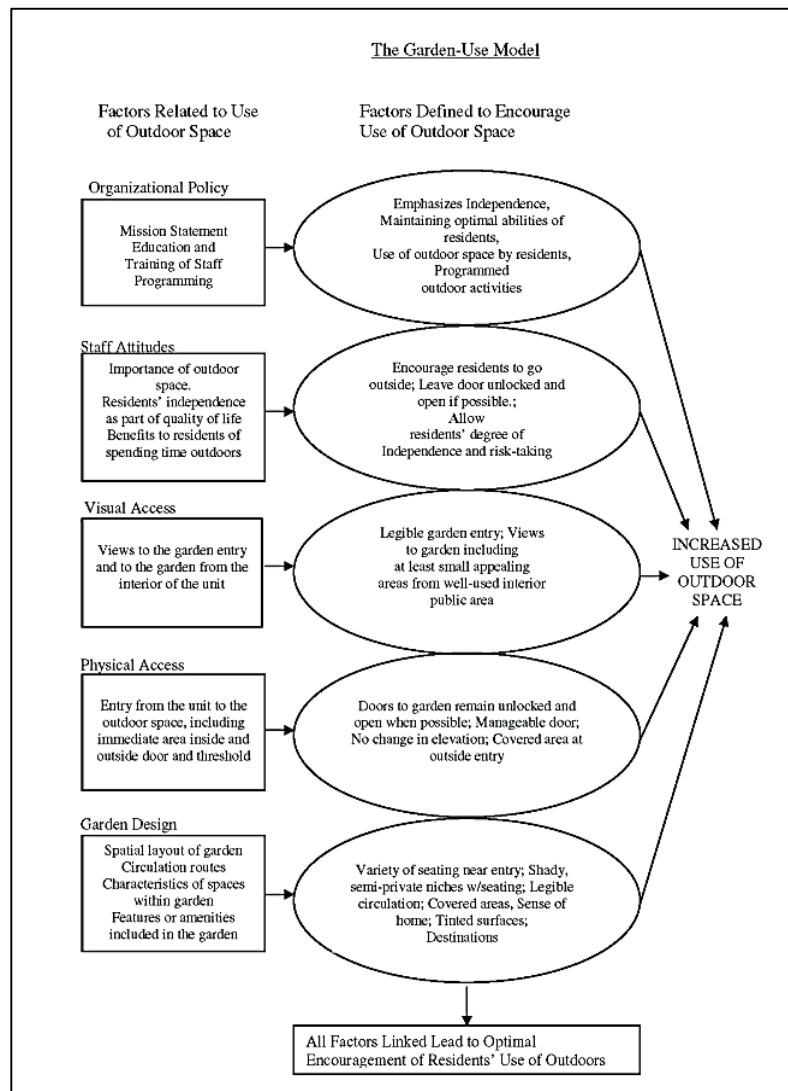


Figure 2-1. Grant & Wineman's garden-use model. Reprinted from Grant & Wineman (2007, p. 109)

4. Conclusion of Research on Functions of Outdoor Environments

The above discussion suggested that stimulating- and supporting-based studies should have guided development of the current knowledge of institutional outdoor space. However, their approaches are less inclusive; given their major focus on affective and behavioral aspects of environments, these studies disallowed caregivers to gain understanding in terms of people' quality of

life and wellbeing. Furthermore, unresolved methodological issues may have reduced research credibility and limited interpretation of available results.

The research approach to maintaining functions of environments seems more suitable to this inquiry because of the three advantages: 1) recognizing the importance of stimulating and supporting functions of environments, 2) presenting more global description of P-E relationships and 3) studying phenomena within a real-life context. It allows a holistic understanding of institutional outdoor environments, and helps portray a “better” outdoor environment.

Reviewed articles on each of the three functions have their unique theoretical background, representing different schools of environmental psychology. The next section reveals their theoretical origin to understand this research collection in a historical context.

Table 2-8. Supporting-based studies

Authors	Research Questions	Related theory	Findings
	Methods		
Rappe & Topo (2007)	How do outdoor environments in maintaining competence of people with dementia in day cares Multiple case studies with observation and field notes	Ulrich's Stress Reduction Theory	<u>Theme #1: Outdoor visiting as a routine:</u> Going outdoors for a walk becomes a daily routine; it can be scheduled when people arrive and leave units, which makes easier to encourage participants with low motivation to use outdoor space <u>Theme #2: Stimulating all the senses:</u> Walking in a garden provides opportunities of sense of balance. Participants can use all their skills and abilities in interactions with natural environments. <u>Theme #3: Easy access to outdoors through windows:</u> For people who have to stay inside due to safety concerns, easy outdoor views enable connection with nature and outdoor activities <u>Theme #1: Accessible outdoor space:</u> Accessible courtyard with a close proximity encourage outdoor activities <u>Theme #2: Multiple spatial and physical accesses to outdoor space:</u> Residents and staff can view and enter outdoor space from many different common areas <u>Theme #3: spatial orientation:</u> Flower boxes, garden furniture, and fountains serve as a landmark to orient resident to meaningful destinations.
Lee et al (2007)	What are supportive design in Swedish elderly care homes Multiple case studies with observation, interviews and field notes		<u>Facilitators:</u> <u>Accessible physical features:</u> Walkways provide opportunities for fresh air and exercise. A close proximity of outdoor space is an advantage. <u>Accessible natural features:</u> Accessible gardening areas with seasonal interests attract outdoor users. <u>Safe outdoor space:</u> Residents use an intended outdoor space when they perceive it to be a safe and secure environment. A covered and protected outdoor space located just outside the indoor space allows residents to have easy and quick access to nature. <u>Staff attitude:</u> Staff encouragement initiates outdoor use. <u>Barriers:</u> <u>Inaccessible physical features:</u> Heavy doors or other physical features that are hard to manager discourage use. Washrooms are far away from outdoor space. The lack of a raised bed makes gardening more difficult for older adults. <u>Insecure environments:</u> Outdoor space that lacks maintenance makes people feel unsafe. Bumping pathways stops people to come out more. <u>Staff's lack of gardening knowledge:</u> Staff does not know how to lead a gardening activity and utilize outdoor resource.
Lovering et al (2002)	What factors facilitate use of garden space of a day care? What are the barriers to use of garden space of a day care? Single case study with observation, interviews and field notes	Ulrich's Stress Reduction Theory	

Rodiek (2006)	<p>What factors facilitate use of garden space of assisted living?</p> <p>What are the barriers to use of garden space of assisted living?</p> <hr/> <p>Multiple case studies with surveys and interviews</p>	<p>Attractants:</p> <ul style="list-style-type: none"> Overhead shelter Sitting areas Porches Gazebos Walking loop Swings Indoor features <p>Barriers:</p> <ul style="list-style-type: none"> Physical configuration of elements Safety/security concerns Insects and/or climate conditions Lack of interesting features 	<ul style="list-style-type: none"> Greenery Fresh air Flowers Birds Water features Other nature elements Sunshine Animals Problems w/sidewalks Problems w/doors Wheelchair usage Distance (too far)
Rappe & Kivela (2005)	<p>What are the barriers to use of garden space of a nursing home?</p> <hr/> <p>Surveys (30 residents)</p>	<p>Hindrances:</p> <ul style="list-style-type: none"> Difficulty in getting assistance to visit Weather conditions Slippery walks 	

II. Analysis of Theoretical Origins: Need for an Integrative Approach

Besides worldviews, the reviewed studies varied in focus in terms of psychological processes of environments or environmental experience (Weisman et al., 2000). The stimulating-and supporting-based studies are linked with environmental perception and/or cognition. The maintaining-based studies showed more interests in environmental action, knowledge, meaning and emotions. They are shaped by different schools of theories in environment-behavior studies. A family tree of theories applied in this collection of research (Figure 2-2) was developed in accordance with their central arguments of environmental experience. The map showed pre-existing theoretical influences on contemporary knowledge and suggested that the current understanding is limited by several knowledge silos (Weisman et al., 2000), which led scholars to understand outdoor environments in a fragmented way.

A. Perception & cognition: stimulating-based studies

The stimulating-based studies were guided by three major theories including Stress Recovery Theory (Ulrich, 1983), Competence-Press Model (Lawton & Nahemow, 1973) and Attention Restoration Theory (Kaplan & Kaplan, 1989) (Table 2-9). Most of the studies were influenced by more than one thinker. For example, studies of Kiyota (2008) and Rodiek (2002) were framed by both Kaplan's and Ulrich's theories. Five studies (e.g., Cohen-Mansfield & Werner, 1998; Connell et al., 2007; Detweiler et al., 2008) were shaped by shared aspects of Competence-Press Model (Lawton & Nahemow, 1973) and Progressively Lowered Stress Threshold Model (Hall & Buckwalter, 1987). Both models helped conceptualize an appropriate amount of stimulation in relation to challenging behavior but the latter addressed impacts of over-stimulation in particular and gave less attention on hypo-stimulation.

As shows in Table 2-9, Lawton's Competence-Press model is the most common framework, followed by Ulrich's theory. One potential reason is that Lawton's model is more applicable to solve problems in institutional settings, allowing care providers to tackle issues in relations to care and

management of challenging behavior. Theories proposed by Lawton, Kaplan and Ulrich are parts of evolving works of environmental perception and cognition; they are seemingly different but in reality closely connected to each other. To understand these theories and their influence on the current research, this study elaborated important concepts of environmental perception and cognition related to outdoor environments in Appendix Q. It aims at placing the reviewed articles in a historical context and understanding how research efforts were continued in this direction.

Plato's and Aristotle's psychology (Canter, 1991)

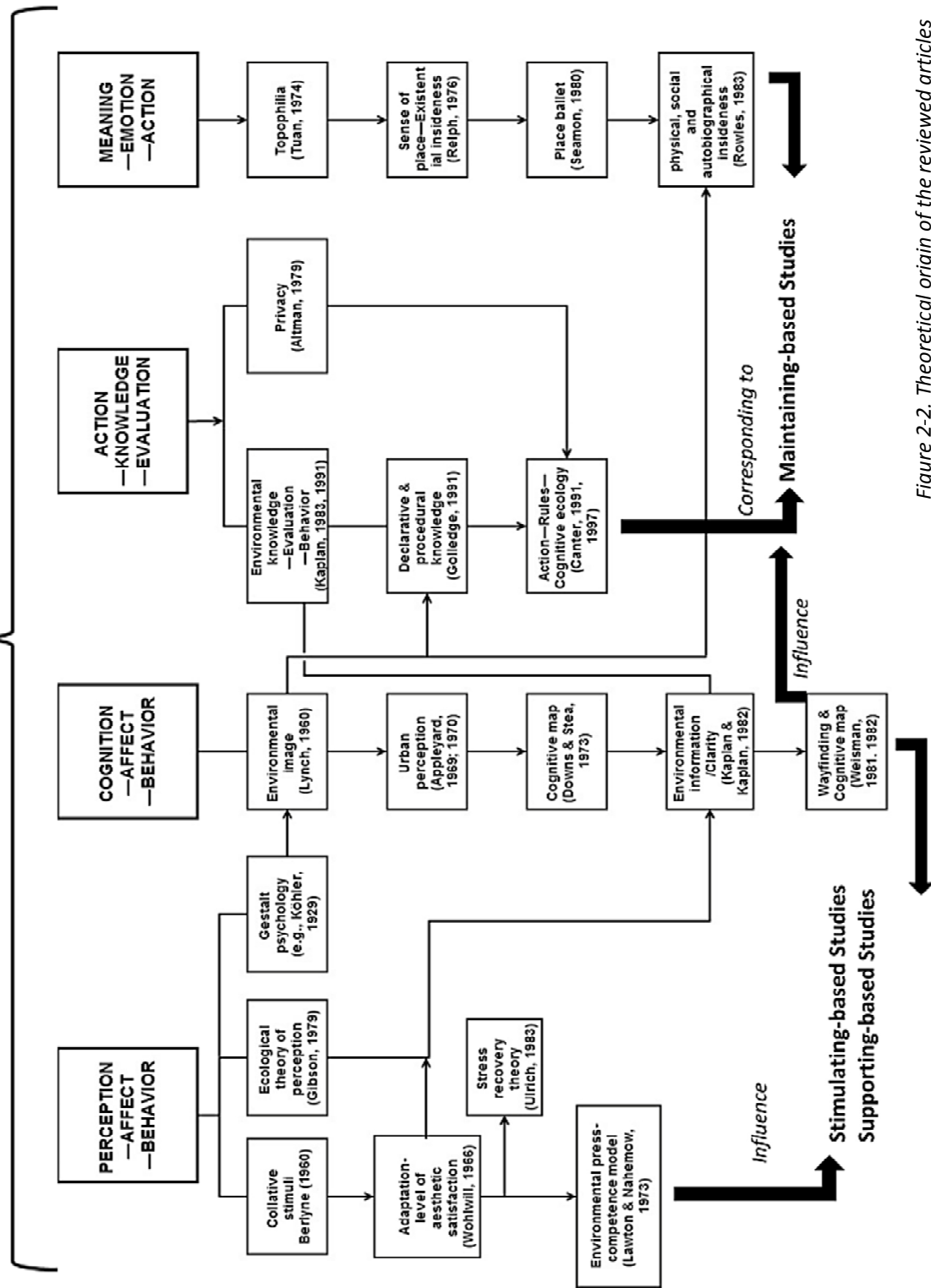


Figure 2-2. Theoretical origin of the reviewed articles

Table 2-9. Theories applied in the stimulating-based articles

	Competence- Press Model (Lawton & Nahemow, 1973)	Attention Restoration Theory (Kaplan & Kaplan, 1989)	Stress Recovery Theory (Ulrich, 1983)	The Progressively Lowered Stress Threshold Model (Hall & Buckwalter, 1987)	Theory related to circadian rhythms	Theory- related to physical- activity	Learned Helplessness (Seligman, 1975)	<i>Unclear position</i>
Calkins et al. (2007a)			√		√			
Cohen- Mansfield & Werner (1998a)	√			√				
Cohen- Mansfield & Werner (1998b)	√			√				
Mather et al. (1997)								
Mooney & Nicell (1992)	√							
Connell et al (2007)	√			√				
Detweiler et al (2008)	√			√				
Detweiler et al (2009)	√			√				
Rappe & Kivela (2005)			√					
Lee & Kim (2008)					√	√		
Ottosson & Grahn (2005)			√					
Rappe & Kivela (2006)					√	√		
Rodiek (2002)		√	√					
Cox et al (2004)								√
Kiyota (2009)		√	√				√	
Jarrott & Gigliotti (2010)	√							
Sugihara & Evans (2000)								√
Total	7	2	5	5	3	2	1	2

B. Unclear position: supporting-based studies

Theoretical positions of the supporting-based research are either ill-defined or associated with theories of environmental aesthetics. Ironically, these aesthetic theories are less concerned with “supporting”. Table 2-10 lists theories applied in this research group and revealed two major issues for future discussion. First, although concepts of universal design (Iwarsson & Ståhl, 2003), prosthetic environments (Lindsley, 1964) and Competence-Press Model (Lawton & Nahemow, 1973) prevailed over research on environmental psychology and environmental gerontology, no study in this collection aligned themselves with any of these concepts and addressed issues of supporting. Second, Ulrich’s or Kaplan’s theory was applied in some of the supporting-based studies but their concepts were not transformed into a theoretical framework to help understand accessibility in environmental preference. Results of these studies usually corresponded to the central argument of Lawton and Nahemow’s Competence-Press Model (Appendix Q) but no studies advanced discussion in complementing the model.

Table 2-10. Theories applied in the supporting-based studies

	Ulrich’s Stress Reduction Theory	Unclear position
Rappe & Topo (2007)	√	
Lee et al (2007)		√
Lovering et al (2002)	√	
Rodiek (2006)		√
Rappe & Kivela (2005)		√
Total	2	3

C. Action, knowledge & meaning: maintaining-based studies

The maintaining-based studies investigated what “better experience” of institutional outdoor environments is. The studies were developed into two directions; one was related to descriptions of therapeutic outdoor environments for people with dementia or Alzheimer’s disease. Studies in this

direction often highlighted convergence of people's action, knowledge and evaluation of environments in maintaining quality of life. Their findings were multifaceted and involved with different dimensions of environments. Theories applied in these studies such as Kaplan & Kaplan's Attention Restoration Theory (1989) and Ulrich's Stress Reduction Theory (1983) only gave partial help in explaining multifaceted phenomena (Table 2-11). A more holistic approach may be a better fit for these studies.

Hoover's (1995) study is an exception. He used Cohen and Weisman's (1991) "therapeutic goals for the environments for people with dementia" as guiding concepts to describe better outdoor environments. These therapeutic goals include 1) ensuring safety and security, 2) supporting functional ability through meaningful activity, 3) maximizing awareness and orientation, 4) providing opportunities for stimulation and change, 5) maximizing autonomy and control, 6) adapting to changing needs, 7) establishing links to the healthy and familiar, 8) providing opportunities for socialization and 9) protecting the need for privacy. These goals were developed to conceptualize nursing home settings as integration of behavioral, cognitive, emotional and social subsystems (Cohen & Weisman, 1991), and thus allowed Hoover to portray outdoor environments in a holistic sense.

To understand theoretical orientation of these articles comprehensively, this study provided discussion of some important theorists and thinkers (e.g., Kaplan, 1991; Golledge, 1991, Altman, 1975; Canter, 1991) who are interested in synthesis of action, environmental knowledge and evaluation (Appendix R). Although their theories or models are not exact guiding conceptualization applied in the reviewed articles, discussion allows capturing essence of the holistic concerns pursued in these articles.

In the second direction, "better experience" is associated with meaningful outdoor environments that enhance self-identity, continuity, personal value. Scholars with this topic (Bartlett, 2007; Berg et al., 2006) did not specify which theory they follow but their theoretical position corresponded to phenomenological approaches applied in studies of human geography (e.g., Tuan, 1974;

Relph, 1976; Seamon, 1979; Rowels, 1983), which emphasizes convergence of meaning, emotion and action. A brief review of key human geographers was provided in Appendix R.

Table 2-11. Theories applied in the maintaining-based studies

Environmental image (Lynch, 1960)	Competence- Press Model (Lawton & Nahemow, 1973)	Attention Restoration Theory (Kaplan & Kaplan, 1989)	Stress Recovery Theory (Ulrich, 1983)	Basic Human Needs (Maslow, 1943)	Therapeutic goals (Cohen and Weisman, 1991)	Unclear position
<i>First direction: integration of action, environmental knowledge and evaluation</i>						
Bengtsson (2006)		√	√			
Hernandez (2007)						√
Cutler & Kane (2005)	√	√	√	√		
Kearney & Winterbottom (2006)		√	√			
Bartlett (2007)						√
Hoover (1995)					√	
Ousset et al (1998)	√					
Zeisel & Tyson (1999)	√					
McBride (1999)						√
<i>Second direction: meaningful environments</i>						
Bartlett (2007)						√
Berg et al (2006)						√
Total	1	2	3	3	1	5

III. Consensus across Studies: Experiential Attributes

A. Recurring experiential themes across studies

The above discussion showed difference of worldviews and theoretical positions among the reviewed articles; it suggested that people's understanding of the world may be fragmented and separated into silos of each intellectual school. The separation contradicted to nature of human experience that is "fundamentally synthetic and integrated" (Weisman et al., 2000, p. 11). It is worth noticing that the research collection also generated consensual knowledge, which is built on shared intentions among the scholars about pursuing human's quality of life. Calkins and Weisman (1999) may describe them as "therapeutic goals" for environments for the elderly, which refer to several similar attempts of defining therapeutic characteristics of residential and care settings for older adults. These characteristics were described by scholars who are well known for their great efforts in improving long-term care settings such as Moos and Lemke (Moos & Lemke, 1980), Lawton et al., (1984), Calkins (1988), Cohen & Weisman (1991), Sloane et al., (1993), Regnier & Pynoos (1992) and Zeisel et al., (1994). The therapeutic characteristics were summarized into eight attributes of experience of long-term care settings (Calkins & Weisman, 1999; Norris-Baker et al., 1999). They included 1) safety and security, 2) awareness and orientation, 3) support of functional abilities, 4) social contact, 5) privacy, 6) personal control, 7) regulation and quality of sensory stimulation and 8) continuity of self.

The attributes or therapeutic goals represented a holistic and global understanding of planned environments; discussion covered "not only the physical setting but also the philosophy of care and program, level of resident capability, constraints of regulations and budget, and other organizational, policy and social contexts." (Norris-Baker et al., 1999, p. 169) Compared to traditional research on the different psychological processes of environments, the attributes take into account pragmatic consideration. As Weisman pointed out, "therapeutic intentions are difficult to articulate in terms of each modality (i.e. psychological processes of environments) and lead to stated desired outcomes such

as reduced aggressive behavior.” (Weisman et al., 2000, p. 11); however, the eight attributes would allow “practitioners to consider the intent behind the behavior — to gain a more holistic sense of the experience — in order to respond appropriately.”

Following Calkins and Weisman’s approach, the entire research collection was analyzed in terms of therapeutic goals or desired experiential attributes implicitly and explicitly revealed by scholars. The purpose is to understand what experience is commonly promoted and pursued by these studies. Analysis revealed experiential themes that scholars seek to achieve through improving physical features (Appendix A), organizational environments (Appendix B) or staff’s interactions with residents (Appendix C). For example, Brawley (2007, p. 272) mentioned, "level, slip-resistant, glare-free walking surfaces help to minimize falls due to the high incidence of osteoporosis in the elderly." The surface feature Brawley addressed may ensure safe environments by preventing residents from falling. Cutler & Kane (2005, p. 45) pointed out, “The actual extent to which and the way spaces are used depends on facility policies (including policies on permitting residents to be outside on their own), and facility practices such as having outdoor barbecues, encouraging family to go outside with residents on the grounds and making sure that seating and tables are clean, dry, and in good repair." Cutler & Kane actually highlighted importance of autonomy, familiarity and social interactions in outdoor settings. Some themes are recurring across studies. These recurring items were grouped into nine major categories:

- 1) Privacy
- 2) Social Interactions
- 3) Accessible space and built features
- 4) Sensory stimulation
- 5) Safety and security
- 6) Familiarity
- 7) Information awareness and spatial orientation
- 8) Sense of ownership
- 9) Participation in meaningful activities

More detailed discussion of each category was provided in next section:

1. Privacy

Privacy is perceived as a desired attribute of outdoor environments. Scholars have found that unmet needs for privacy may cause underutilization of outdoor space (Cranz & Young, 2006; Rappe et al., 2006). Discussion of privacy in the reviewed articles implied control of visual or auditory information. Scholars suggested that seats with partially enclosed by plants (e.g., Mooney & Nicell, 1992; Grant & Wineman, 2007; Sherman et al., 2007), and seats located away from windows, entrances or mainstreams (Cranz & Young, 2006; Cutler & Kane, 2005; McBride, 1999) may reduce visibility or prevent conversations from being heard. Besides, Lovering (1990) and McBride (1999) found that flexible seating may facilitate control on visual or auditory contact; privacy can be achieved by changing chair orientation and distance.

2. Social interactions

Loneliness and social isolation are serious issues among residents in long-term care settings (Thomas, 1996). Scholars found that an intended outdoor space would encourage spontaneous social contacts between residents, and accommodate family gatherings (Cohen-Mansfield & Werner, 1998; Lee & Kim, 2008; Heath & Gifford, 2001; Cox et al., 2004; Pettigrew & Roberts, 2008). Outdoor social interactions can be facilitated by shaded space furnished with movable chairs and tables (Lovering, 1990; McBride, 1999; York, 2009; Brawley, 2007). Movable furniture allows people to create social settings based on their needs for privacy or for micro-climate comfort. Besides that, social interactions in gardens or courtyards may trigger reminiscence and enhance past social roles (Allen-Burge et al., 1999). Spontaneous conversations related to home gardens and gardening may encourage people to share personal stories, and enhance a past social role such as a gardener or mother.

3. Accessible space and built features

The attribute describes experience of people whose functional loss is compensated for by physical environments. It is often discussed in two directions: accessible space and built features. Issues

of spatial accessibility include a discontinuous path or a walkway with inadequate lighting (Mooney & Nicell, 1992), slippery or uneven paths, thresholds (Rappe & Kivela, 2005), paths without adequate space for two wheelchairs passing (Rodiek, 2006; Rappe & Topo, 2007) and unlighted entries (York, 2009). They are factors limiting accessibility to outdoor space. Accessible built features refer to experience that people with disability are able to reach landscape or built outdoor elements. Features that facilitate wheelchair usage include manageable doors or reachable wheelchair touch pad (Grant & Wineman, 2007; York, 2009), raised gardening areas (Cohen-Mansfield, 2007), prosthetic tools of gardening (Kiyota, 2008) and accessible gardening structures (e.g., gazebo) and furniture (e.g., swings) (McBride, 1999). An important notion underlying in either direction is maximization of independence. Any feature should avoid serving as cues reinforcing image of disability (Butler & Bowlby, 1997) and senses of learned helplessness (Brown & Furstenberg, 1992; Evans et al., 2001).

4. Sensory stimulation

This attribute is related to five-sense experience in outdoor environments. In this research collection, sensory stimulation is discussed in two dimensions: 1) quality and 2) an appropriate level of stimulation. Some scholars (e.g., Grant & Wineman, 2007; Lovering et al., 2002; McBride, 1999) argued that natural environments have a particular quality creating therapeutic benefits that is absent from human-made environments; natural elements (e.g., sky, sunlight, fresh air, trees, flowers, wild animals) are ready to provide interesting and pleasant stimulation without stress. It is restorative and helps improve psychological and physical health.

Outdoor activities are often involved with multiple-sensory experience (i.e., tactile, olfactory and hearing experience), which may help reach an optimal level of stimulation (Lee & Kim, 2008; Cox et al., 2004; Jarrott & Gigliotti, 2010). On the other hand, scholars like Detweiler et al (2009), Connell et al (2007), and Cohen-Mansfield & Werner (1988) contended that being in outdoor environments brings

tranquility; outdoor space acts as a counterbalance to indoor environments that often produce excessive stimulation (e.g., noise, crowding).

5. Safe and secure environments

Experience of safety and security is discussed in three dimensions. First, scholars such as Detweiler et al (2008) and Brawley (2007) emphasized a monitored outdoor space in which staff give regular on-site visits or monitor outdoor residents from the inside. They found staff surveillance not only ensures safe environments but also serves as cues indicating that things can be taken care of right away. Second, many scholars highlighted importance of shade devices because they allows residents to regulate micro-climatic conditions by providing protection from the rain, wind and sun (e.g., Hernandez, 2007; Pachana et al., 2003; Cranz & Young, 2006; Rappe et al, 2005); some adjacent spaces (Zeisel & Tyson, 1999) or transitional spaces between indoor and outdoor environments (McBride, 1999; Brawley, 2007) are recommended. Third, a well-maintained outdoor space is another important factor. For example, safe walking paths (e.g., no recessed mulch along the side, steep and uneven surface) may prevent falls (Detweiler et al., 2009; Rappe & Kivela, 2005; Grant & Wineman (2007). Adequate lighting and handrails may ensure safe outdoor visits. Non-toxic plants with no thorns, chemical and minimum pollen are also critical (Kiyota, 2009; Hoover, 1995).

6. Familiarity

Familiarity is viewed as an important experience in helping transition of relocation to a nursing home. Cohen-Mansfield & Werner (1998) found that a major reason that nursing home residents are afraid of leaving their units is a lack of familiarity. Ottosson & Grahm (2005) argued that familiar environments are foundation of senses of security; an outdoor garden or courtyard is a familiar space that makes people feel at home. Discussions of familiarity related to outdoor environments are taken into two directions: familiar activities and consistent knowledge. First, some scholars found that senses of familiarity can be realized through taking actions. Familiar daily activities such as gardening and

exercising trigger connection with past life experience (Brawley, 2002; Cohen-Mansfield, 2007; Lee & Kim, 2008) and allow continuing or developing familiar routines/rituals (Zeisel & Tyson, 1999; Cox et al., 2004; Hernandez, 2007). Second, familiarity is conceptualized as experience in evaluating consistency between existing and past environmental knowledge. For example, a layout in which garden space is connected with dining or kitchen space may trigger senses of home (Marcus & Barnes, 1999). Garden structures and decoration such as an arbor, a gazebo or a birdfeeder may serve as a cue of participation in outdoor leisure and social interactions (Zeisel & Tyson, 1999). Outdoor environments with local flowers, vegetables, lawn and comfortable chairs may help recollection of an image of home (McBride, 1999) by triggering familiar sensory experience and perception of environments (e.g., familiar fragrance) (Mooney & Nicell, 1992).

7. Information awareness and spatial orientation

This attribute describes a state experienced by people who have easy access to information regarding outdoor activities and outdoor environments. The attribute is mainly concerned with consolidation of existing knowledge and prediction of what will happen next. Outdoor environments with this attribute are characterized by different mediums for information communication about activity schedules, policy and ongoing events (Kearney & Winterbottom, 2005). Besides, outdoor settings with high visual connection with indoor environments may help residents obtain outdoor information in terms of seasons and time from their rooms and public indoor space (e.g., Lovering et al., 2002; Bengtsson, 2006). Different cues such as maps and signage may remind residents of existence of outdoor space (e.g., Pachana et al., 2003; Heath & Gifford, 2001) and facilitate navigation (e.g., Mooney & Nicell, 1992; Bossen, 2010; Zeisel & Tyson, 1999).

8. Sense of ownership

The attribute covers several discussions including autonomous outdoor visits (e.g., Rappe et al., 2006; Cranz & Young, 2006), personalization or individualization of outdoor environments (e.g., Heath &

Gifford, 2001; Rappe & Topo, 2007) and choices of activity (e.g., Kiyota, 2008; Cranz & Young, 2006); residents or patients are able to decide when to visit gardens, who to come with, what to do and where to sit. Simply speaking, the attribute addresses experience that residents make their own rules of outdoor use. This theme is often associated with discussion of accessible outdoor settings to reveal how much independence and autonomy residents have.

9. Participation in meaningful activities

The theme describes experience of meaningful interactions with outdoor environments. It is involved with a process of enhancing personal value and identity through manipulating environments (Brawley, 2002). For example, gardening activities that comprise a process of planting, watering, weeding, deadheading, harvesting, preparing food are identified as meaningful and therapeutic (e.g., Kiyota, 2009; Barlett, 2007; Berg et al., 2006; Brawley, 2007). These activities provide opportunities of taking actions on natural environments to display identity or express personal taste and preference (Gross & Lane, 2007). Gardening is also a physical activity that helps build muscles and increase flexibility. It is perceived as a therapeutic exercise for older adults to maintain health (Allen-Burge et al., 1999). Other activities such as cooking, preparing food and carrying chores also provide similar benefits and bring life-enriching experience (Berg et al., 2006; Brawley, 2002; Brawley, 2007; Pettigrew & Roberts, 2008).

Grant et al (2007) found staff's attitude and organizational policies have strong influences on residents' activity participation. For example, if an outdoor policy allows free outdoor access, and staff are willing to encourage self-initiative outdoor activities, residents will be more likely to utilize garden space.

Conclusion

In this research collection, the majority of research efforts were given to describe ideal physical settings in creating desired experiential attributes. Although some implications were made to indicate

importance of staff and organizational environments, there is a lack of systemic understanding of their roles in creating, operating and managing outdoor environments. Besides, the nine attributes derived from the collection are comprehensive but lack theoretical underpinning. There is a need of developing theoretical framework to support the description of experiential qualities of environments.

The two issues were addressed in the next chapter. It offered a philosophical stance and theoretical perspective to synthetic nature of the attributes. Studies focusing on institutional interior environments were discussed because there is well-developed knowledge to help conceptualize the nine attributes.

CHAPTER 3 : CONCEPTUAL FRAMEWORK

As stated in Chapter 2, there is a need for breaking down traditional knowledge silos and developing a holistic approach to understanding institutional outdoor environments. The holistic approach should be inclusive and covering physical settings, different social roles and their interactions with environments. The inclusiveness suggests a pluralist worldview, which acknowledges and appreciates the existence of different lenses through which to view the world.

This chapter presented philosophic discussions that support multifaceted nature of the phenomena. A major point of the discussions is that there is more than one way of being true. Each approach constructs an appropriate knowledge in a given situation. Following the philosophic discussion is the review of theories or models that help describe the multiple contexts of the outdoor environments. Based on the theories, the final section offers a means to conceptualize outdoor environments of nursing homes. The conceptualization will serve as guidance in data analysis and interpretation of outdoor environments of nursing homes.

I. Conceptualizing Coexistence of Multiple Paradigms

Coexistence of different paradigms suggested there is more than one way to construct knowledge of reality. Such pluralistic thinking can be traced back to William James's conceptualization of truth, which may provide background understanding of Polkinghore's (1992) and Fishman's (1999) neopragmatism or postmodern pragmatism. The pragmatic approach would lead to better understanding of Groat and Wang's (2002) idea of "intersubjectivism". It emphasizes integration of different approaches to architectural research.

A. James's conceptualization of truth: Workability

James's description of truth is pragmatic in nature. As he mentioned, "True ideas are those that we can assimilate, validate, corroborate, and verify. False ideas are those that we cannot. That is the practical difference it makes to us to have true ideas; that therefore is the meaning of truth, for it is all that truth is known as." (James, 1975, p. 2) From his perspective, the process of assimilation, validation, corroboration and verification is embedded with practical rationale, that is, "truth" has to be examined with its practical value. He further explained, "The most ancient parts of truth . . . also once were plastic. They also were called true for human reasons. They also mediated between still earlier truths and what in those days were novel observations. Purely objective truth, truth in whose establishment the function of giving human satisfaction in marrying previous parts of experience with newer parts played no role whatsoever, is nowhere to be found. The reasons why we call things true are the reason why they are true, for 'to be true' means only to perform this marriage-function." (James, 1907, pp. 36-37) (pp. 36-37) In a word, true ideas are true because they can be applied to verifying our experience and improve functioning.

There are three major features in James's pragmatic truth including a functionalist perspective, a social-based concept, and metaphysics of experience.

A functionalist perspective

From James's perspective, truth is characterized by "workableness" and can be verified by the presence of "promise" (James, 1975, p. 4), that is, truth can make practical differences and ensure a good end. "To agree in the widest sense with a reality can...be put into such working touch with it as to handle either it or something connected with it better than if we disagreed. Better either intellectually or practically...Any idea that helps us to deal, whether practically or intellectually, with either the reality or its belongings, that doesn't entangle our progress in frustration, that fit, in fact, and adapts our life to the reality's whole setting, will agree sufficiently to meet the requirement. It will be true of that

reality.” (James, 1975, pp. 2-3) James exemplified the notion in discussions of whether God exists. From his perspective, the idea “God exists” is pragmatically true because it makes people feel good (James, 1975).

Therefore, the pragmatic truth is involved with some positive consequences in life experience of its believers (Suckiel, 1982). James associated the consequences to “satisfaction”, which indicates a state that believers’ intention and expectation is not discontinued (Lamberth, 1999). In other words, true ideas allow people to predict future, fulfill purposes and meet interests (Suckiel, 1982). Furthermore, the concept of “satisfaction” suggests that the pragmatic truth is evaluative and verifiable. People test ideas in their daily life when attempting to accomplish goals. James pointed out, “Its verity is in fact an event, a process, the process namely of its verifying itself, its verification...The true, to put it very briefly, is only the expedient in the way of our thinking, just as the right is only the expedient in the way of our behaving. Expedient in almost any fashion and expedient in the long run and on the whole, of course; for what meets expediently all the experience in sight won’t necessarily meet all further experiences equally satisfactory. Experience, as we know, has ways of boiling over, and making us correct our present formulas.” (James, 1975, p. 2)

To conclude, James’ concept of truth is not independent from people’s experience (human action, feelings and belief); any true idea is a short-term or long-term expedient of human interests.

Social-based concepts: consensus

According to James (1975), verification of truth is “surrounded by their causes and the influences they obey and exert, and along with the whole environment of social communication of which they are a part and out of which they take their rise.” (p. 104) Verification is tied up with its context and “agreements” between people. James mentioned, “Pragmatism defines “agreeing” to mean certain ways of “working”, be they actual or potential.” (James, 1975, p. 85) To prove one’s statement of existence of a desk to be true, others are required to recognize the desk as a real thing, to

shake it and to use common language to describe it by words. "Only in such ways as this is there sense in saying it agrees with that reality, only thus does it gain for me the satisfaction of hearing you corroborate me. Reference them to something determinate, and some sort of adaptation to it worthy of the name of agreement, are thus constituent elements in the definition of any statement of mine as "true"."(James, 1975, p. 86) In this sense, the pragmatic truth is accessible to other people. It can be verified through others' judgement on objects or events (Lamberth, 1999). In this regard, the pragmatic truth is characterized by the shared knowledge in terms of collective verification and judgments about how to work with objects or deal with events (Lamberth, 1999).

Metaphysics of experience

Based on the above discussion, James's pragmatic truth is attributed with "good" experiences in terms of satisfaction and shared workable knowledge. James explained, "The pragmatist view of the truth-relation is that it has a definite content, and that everything in it is experienceable." (James, 1975, p. 5) "Experience" is treated by James as the foundation of thoughts and things related to truth (Seigfried, 1990). He mentioned, "If we start with the supposition that there is only one primal stuff or material in the world, a stuff of which everything is composed, and if we call that stuff "pure experience", then knowing can easily be explained as a particular sort of relation towards one another into which portions of pure experience may enter. The relation itself is a part of pure experience; one of its "terms" becomes the subject or bearer of the knowledge, the knower, the other becomes the object known." (James, 1976, pp. 4-5)

James conceptualized the pure experience as results of constellations of relations between the knower and the object known(Heft, 2001). In James's example, pure experience of a book in a room does not suggest experience of the book and room separately nor imply representation of the book and room image. According to him, people's experience is "simultaneously being a part of two different sets of relations within experience" (Helft, 2001, p. 29) The two sets of relations consist of interactions

between the knowers in terms of perception and cognition, and the room perceived in terms of its experienceable qualities (e.g., colors and forms) (Helft, 2001). In other words, people, the book and the room are experienced as a whole.

Lamberth (1999) argued that James's pure experience has both monistic and pluralistic qualities because all things are drawn from experiences, while at the same time a diverse content is allowed within the pure experience. Another feature of the pure experience is that it has both phenomenological and physical qualities. On one hand, it is related to feelings or sensations—"subjective reception of qualities" (Seigfried, 1990). On the other hand, it deals with objects— objective things or environments in a complex (Lamberth, 1999). The concept of the pure experience is thus viewed as a successful approach that transcends the subjective-objective dichotomy. From Lamberth's perspective, the concept shows James's intention of keeping ambiguity in phenomenological and metaphysical contexts, and from Seigfried's (1990) perspective, it shows James's ambitions of "unity in multiplicity" (p. 240).

Another feature of the pure experience is selectivity. Influenced by Darwinian evolutionary biology, James applied a probabilistic perspective to human experiences and action. He argued that relations between the knower and the object known are directed by things that can fulfill practical and aesthetic purposes due to their higher promise of a good end. More specifically, although there is a radical variation of objects or events in everyday life, people have a "dissociation" process in which "the human thinker breaks up the concretes of immediate experience and substitutes those similar essences, attributes, or abstractions in ways that solve problems and serve interests." (James, 1983 cited in Seigfried, 1990, p. 101) In other words, people select certain contexts and seek certainty. The certainty is characterized by a familiar and workable scheme that helps solve problems. In this regard, the pure experience is built on practical rationality and is composed of gestalt-like organizations—workable patterns of improving human functioning.

The concept “unity in multiplicity” has been paid attention in the field of psychology especially by researchers who face paradigmatic debates and call for an integrative approach. Polkinghorne and Fishman offer a pragmatic approach to paradigmatic pluralism, which is introduced in the following section.

B. Polkinghorne’s neo-pragmatism: postmodern epistemology of practice

Pragmatism or American Pragmatism were initiated by William James, John Dewey and Charles Pierce. It was transformed by Richard Rorty, Donald Davison and other scholars into neo-pragmatism (Fishamn, 1999). Influenced by Rorty and other postmodern thinkers (in both skeptical and affirmative postmodernism), Polkinghorne (1992) suggests that postmodern epistemology is characterized by four features including foundationlessness, fragmentariness, constructivism and neo-pragmatism. The first three themes reflect a position opposite to universalism. The last one shows Polkinghorne’s attempt of “seeking understanding despite uncertainty” (Weisman, p. 12, n.d.).

Polkinghorne’s neo-pragmatic knowing seeks for organized and meaningful experiences. The experiences emerge from unification of science and practice. According to Polkinghorne, by collecting “descriptions of actions that have effectively accomplished intended ends” (p. 151), pragmatic scholars attempt to answer questions of “knowing how”. The underlying assumptions of pragmatic epistemology include 1) no objective and universal truth of knowledge; 2) socially constructed understanding; 3) knowledge as a process of continuous change (elements and events evolve with context), and 4) knowledge verification lying in its usefulness of improving task efficiency. Polkinghorne explained, “Neo-pragmatism accepts the postmodern conclusion that there can be no coherent predictive body of knowledge based on a transparent access to an independent reality. It does not, however, accept that a postmodern discipline has to be solipsistic and relativistic...Neo-pragmatism shifts the focus of knowledge generation from attempts to describe the real as it is in itself (theoretical knowledge and

“knowing that”) to programs to collect descriptions of actions that have effectively accomplished intended ends (practical knowledge and “knowing how”)(p. 151)

Neopragmatic psychologists understand the worlds through understanding patterns or “summary generalizations” (P. 151). Their interpretation of pragmatic knowledge is to reveal “practical success of cognitive patterns”. “Patterns” contains all elements and their relations including “expectations, images and techniques” (p. 152). Polkinghorne pointed out, “The more open we are to increasing and revising our patterns, and the greater variety of organizing schemes we have at our command, the more likely we are to capture the diversity of organization that exists in the world” (p. 152).

Neo-pragmatism allows Polkinghorne to settle dispute between psychology of practice and academic psychology. Traditionally, the former focuses on dynamics of practitioner-client interactions. The latter emphasizes laws of human behavior and serves as guidance of practice; however it is often considered as inappropriate to guide the practitioners’ action. In epistemological pragmatism, practicing psychologists develop a site-specific or client-specific knowledge to provide a better responsive service (Polkinghorne, 1992). Laws developed by academic research serve as metaphors or descriptive concepts. Furthermore, pragmatic knowledge is also generated from practitioner’s expertise, training and clinical experience. Products of knowledge are presented as real case studies.

In Polkinghorne’s epistemological pragmatism, scientific efforts are allowed. Although he rejected epistemological positivism, Polkinghorne encouraged incorporation of qualitative and quantitative strategies to collect, deliver and test patterns for better practice. Polkinghorne explained, “Neopragmatism also holds to the notion of equifinality— that is, the same end can be accomplished in multiple ways. The determination of the value of an action depends on whether it fulfilled its purpose, not whether it followed a particular recipe.” (p. 152) That is, if scientific trials can contribute to knowledge of actual practice, they will be employed to achieve action goals.

To conclude, Polkinghorne's psychology of practice is an inquiry. It aims at generating pattern-based knowledge and solving problems. The inquiry reflects an interdependent relationship between research and practice. It is clear from Polkinghorne's description that academic psychology has some play in practice; however, it is unknown how a reverse relationship is processed. Fishman delved further into that aspect.

C. Fishman's pragmatic psychology: practice as inquiry

Following James, Dewey, and Polkinghorne, Fishman (1999) provided a detailed review of neopragmatism in terms of its philosophy, epistemology, method, and application. His purpose is to build an integrative and alternative paradigm to solve a left-right and academic-practice dispute in psychology.

1. Epistemological pragmatism

Fishman's (1999) study focuses on integration of three epistemological paradigms: positivism, pragmatism and hermeneutics. From his perspective, research in epistemological positivism is a study knowing the world "from the outside" or through something that is visible or measurable. For example, behaviorism views behavior "as something outside of and separate from ourselves" (p. 58). Elemental analysis and objective reality is what positivist scholars emphasize.

On the contrary, research in epistemological hermeneutics knows the world "from the inside". Scholars in this group are more interested in understanding behavior and its corresponding "conscious inner life, with its mixture of thoughts, feelings, sensations, images, and intuitions." (Fishman, 1999. p. 96) Context-specific events and holistic analysis are their primary focus.

He described epistemological pragmatism as "a type of hybrid of the other two". Table 3-1 shows Fishman's summary of positive and hermeneutic influence on pragmatism. For instance, influenced by epistemological hermeneutics, pragmatic psychologists understand the world "from the inside". They see "reality is constructed from holistic experience, combining perceptions, beliefs,

feelings, intentions, and values” (p. 96) and argue that it is not possible to separate “facts” from values in reality.

Table 3-1. Summary of paradigmatic influence on pragmatism (Adapted from Fishman, 1999, p. 99)

	Underlying Epistemology	Primary site of research	Primary source of knowledge	View of behavior	Goal of research	Research method	Unite of analysis
Features of Pragmatic paradigm	<i>Social constructionism</i>	<i>Natural settings</i>	<i>Observation</i>	<i>Behavior as determined & predictable</i>	<i>Solution of context-specific, practical psychological problems</i>	<i>Quantitative & qualitative</i>	<i>Elemental & holistic</i>
Paradigmatic influence	Hermeneutic paradigm	Hermeneutic paradigm				Hermeneutic paradigm	Hermeneutic paradigm
			<i>Positivist paradigm</i>	<i>Positivist paradigm</i>		<i>Positivist paradigm</i>	<i>Positivist paradigm</i>

Pragmatic views of behavior reflect some positivist thinking. Pragmatic psychologists conceptualize behavior as determined and predictable because behavior is shaped by rules or Gestalt law of organization. It is not random and indeterminate.

According to Fishman, one unique feature of the pragmatic paradigm is its research goal—amelioration of social problems. It aims at solving human practical problems rather than developing scientific theory or increasing academic understanding of specific events.

2. Professional activity as disciplined inquiry

Epistemological pragmatism changes nature of knowledge from “knowing why” to “knowing how” (Polkinghorne, 1992, p.159). It also changes processes of knowing by uniting academic research and practice. Following Peterson (1991), Fishman viewed professional activity as disciplined inquiry. Although Polkinghorne has made a similar attempt, there is a lack of details about how practice is integrated with basic science.

As Peterson (1991) pointed out, professional activity is categorized as applied science in positivist psychology, suggesting a linear and subordinate relationship between basic science and application (Figure 3-1). In this linear process, “the first task was the establishment of basic psychological science. Once the laws of psychological nature were known, applied research could produce the technology required for effective professional service. In this scheme, temporal priority, generality, and social value are all ordered from left to right.” (Peterson, 1991, p. 425)



Figure 3-1. Professional activity as applied science (Reprinted from Fishman, 1999, p. 10)

Pragmatic psychologists treat practice as disciplined inquiry (Fishman, 1999) (Figure 3-2). Research is initiated by client’s needs and desires for change. Problems presented by clients are assessed through qualitative and/or quantitative methods guided by theoretical concepts, literature review, and practitioners’ past experience. The theoretical concept is the knowledge derived from “basic science”. It serves as guiding conception of assessment rather than a theory for testing. The conception is often characterized by multivariate and systemic in order to capture a real-life situation.

Results of assessment are employed in formulations that entail the best understanding of clients (Peterson, 1991). Formulations imply actions and changes, and require evaluation. An unsatisfactory evaluation may lead to revise formulations and actions. One unique feature of the process is that results of evaluations provide feedback to guiding concepts and existing knowledge.

As shown in Figure 3-2, Fishman’s model of inquiry is systemic. It is characterized by reciprocal relationships between steps—each step shaping and being shaped by others. The system ensures quality of knowledge through feedback loops between clients, theoretical concepts, assessments, actions and

evaluations. In other words, the model is naturally built with “internal-functionality validity” or “internal-connectedness validity” (Fishman, 1999, p. 161).

Another feature of this model is that each step is a subsystem of an inquiry. For example, the step of “formulation” and “evaluation” may contain several steps/components including identifying issues and contextual variables, developing options of models and selecting a strategy. Feedback loops also exist between these steps to ensure quality formulations and evaluations. In other words, there are a lot of dynamics embedded in each of the steps, making the model sensitive to changes of environments.

Overall, the model suggests that “every client can be a subject and every practitioner a scientist” (Peterson, p. 427); it breaks the boundary between research and practice, and creates a model showing that practice itself is research, and theory is intrinsic to practice.

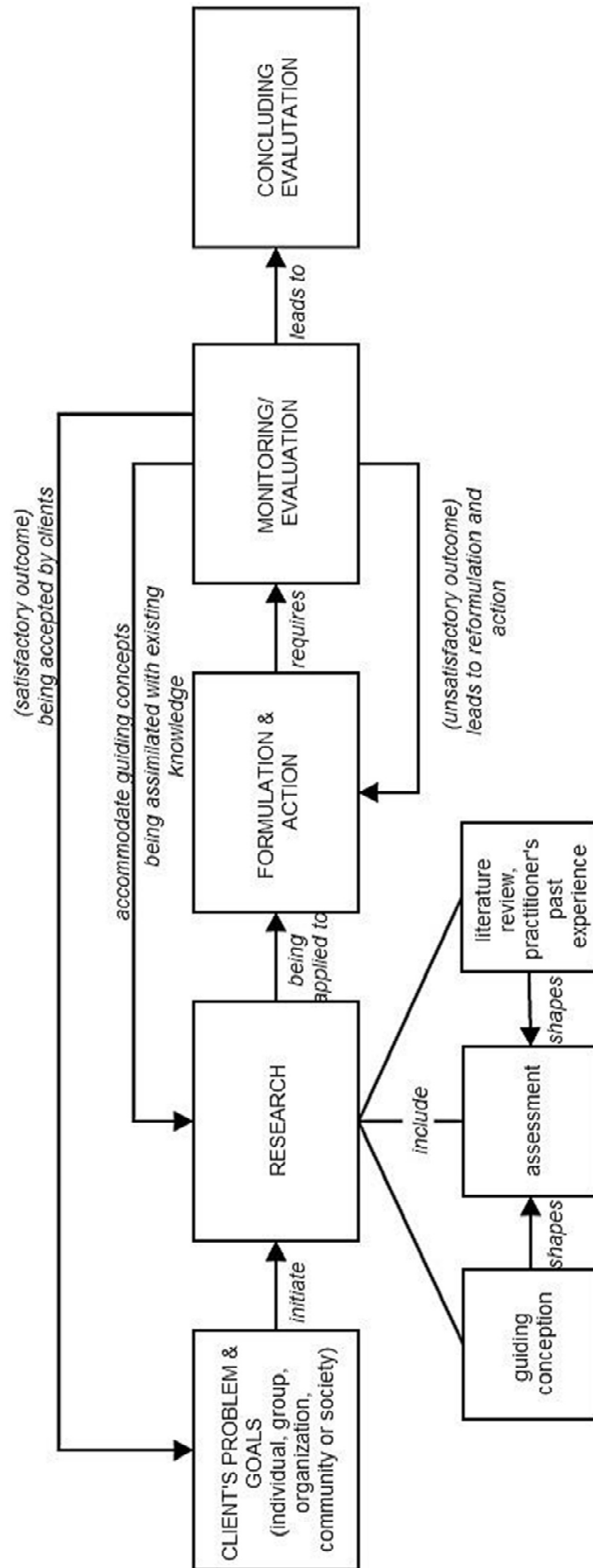


Figure 3-2. Professional activity as disciplined inquiry
(Adapted from Fishman, 1999, p. 11)

3. Pragmatic case study

A pragmatic inquiry is to “aid in the planning, development, implementation, evaluation, and documentation of the individual human service case settings, frequently called “projects,” which comprise programs.” (Fishman, 1999, p. 136) One major purpose is to program or identify successful cases. A collection of outstanding cases allows scholars to document and examine successful models in contrast with less successful cases. According to Fishman, there are two major elements of pragmatic case studies: program evaluations and collaboration.

1) Program evaluation

A program evaluation refers to research on a particular human services program. The purpose is to “make better, more rational decisions and to improve human service programs.” (Fishman, 1999, p. 138) Program evaluations are judged by their consequences and practical values. Findings may help improve existing programs to achieve better results. However, Fishman does not elaborate processes of evaluation; his discussion remained abstract.

According to Fishman, a program evaluation is often involved with “pattern-matching” (Yin, 1994). He redefined Yin’s concept using a pragmatic framework and viewed it as a process in which “a pattern of effectiveness in matching the ideals of organizational quality”. The ideal pattern is “an arrangement of a program’s outcome indicators that reflect a desirable pattern of program achievement. In other words, the matched pattern in Yin’s study is based on theory, while in the pragmatic study, on ideals” (p. 177) A detailed comparison of methodology between Yin’s case study and Fishman’s pragmatic case study is provided in Chapter 4.

2) Collaboration: a way of building consensus

To Fishman, a pragmatic case study process is collaborative. It suggests that “researcher needs to be willing to let the community help determine part of the character of the research project...” (p. 148). Researchers do not identify and determine goals for their clients. Instead, they encourage dialogue

and help narrow down their focus— values and goals—with a rationale. From Fishman’s perspective, collaboration is involved with negotiation; it aims at achieving consensus or sharing perspectives. Client’s goals and needs thus contain a mixture of different perspectives from various groups. Fishman mentioned, “...selection and negotiation processes flow from the constructionist and dialogical notions of postmodernism that see human beings as co-creating their reality through participation.” (p. 148). For example, values and goals of a nursing home are constructed by different social groups such as the administrator, staff members, residents and family groups. The administrator and staff may expect a well-controlled outdoor setting to ensure safety. However, such environments may contradict resident’s typical interest in de-institutionalized and home-like settings. The conflict may be solved by negotiation; different groups co-create or agree with outdoor use policy so safety and interesting activities are both considered in outdoor environments.

4. The form of knowledge in the pragmatic model

The knowledge generated from a pragmatic case study is consensual and pattern-based. The pattern-thinking reflects an attempt of maintaining central ideas of Gestalt psychology— finding rules within uncertainty. Ideas of consensus suggest reality is created through embellishing social agreement for a better consequence.

1) Pattern

Fishman’s pragmatic paradigm is characterized by a contextualist worldview. The idea of contextualism does not imply a disorder and unfettered world. According to Fishman, human construes the world through “organizing gestalts or patterns that give meaning and scope to the vast array of details that, without the organizing pattern, would be meaningless or invisible (p. 107). These patterns are related to different indicators: human experiences, consciousness, intentions, value and beliefs. Results of a pragmatic inquiry can be viewed as patterns of different indicators. An ideal pattern reflects the most desirable arrangement of outcome or experiential indicators. The ideal pattern is not based on

a theoretical prediction as proposed by Yin but is based on ideal practice that matches client's desires and quality of life. In such framework, a better practice suggests that an organization or program has better patterns of quality indicators in creating desirable experiences.

Understanding the pattern-based knowledge, from Fishman's view, goes "beyond the present logical impasse between advocates of objectivism and those of relativism to focus on the practical problems in contemporary life— social, political and cultural" (p. 109). However, Fishman gave little explanation of what a pattern is in terms of experiences, activities and environments, and gave few clues to understand a social program in terms of patterns in his two examples: psychology and psychotherapy and educational reform.

2) *Consensus*

Fishman's consensual knowledge is related to conceptual synthesis and conflict solving (or efficient operating). The conceptual synthesis suggests a convergence of different, sometime competing epistemological approaches. Without rejecting hermeneutic and positivist pictures of the worlds, pragmatists argued there is a third approach that incorporates best thinking of the two traditional paradigms into a new form.

A consensus implies solving conflicts. Consensual values and goals suggest agreed-on reality and knowledge exist across groups of people. To achieve a consensual result requires participation, collaboration and negotiation between different parties. These processes are referred to as what Fishman called, "democratic decision making", in which different experience is valued, and "conflicts should be articulated and chosen through dialogue and democratically negotiated agreement" (p. 144).

Besides consensus across paradigms and clients, Fishman seeks for consensus across cases. His pragmatic model welcomes a multiple-cases study because different contextual situations can be accumulated, and a variety of practice patterns can be recognized. The accumulation of case reports

increases probability of discovering consensual patterns, which suggest a reasonable degree of generalization without neglecting context.

Groat & Wang showed a similar approach in discussions of architectural design as research. They provide an alternative paradigm to capture a multiple-disciplinary nature of architectural research and to bridge a research-design gap (Groat & Després, 1991).

D. Groat and Wang's intersubjectivism: bridging design and research

1. A middle ground approach

Following Morgan and Smircich (1980), Groat & Wang (2002) conceptualized different paradigms as continuum and argued that there is middle ground— intersubjectivism—between positivism and radical constructivism (Table 3-2). According to them, this conceptualization “recognizes both the multiplicity of distinct perspectives and the importance of socially shared action and knowledge.” (p. 76) They explained, “Ontologically, it assumes that although there are multiple diverse viewpoints regarding sociocultural realities, it is nevertheless possible to achieve shared understandings of those realities” (Groat & Wang, 2013, p. 78). Research in this paradigm has no attempt on establishing a value-free position but it has great interests in revealing unique meanings under a particular context. An interactive or a causal relationship is possible in explaining phenomena but it has to be considered within its social-cultural context. The concept of intersubjectivism is similar to Wahl and Weisman's (2003) organismic or systemic approach, which reflects an ontological position acknowledging heterogeneous viewpoints.

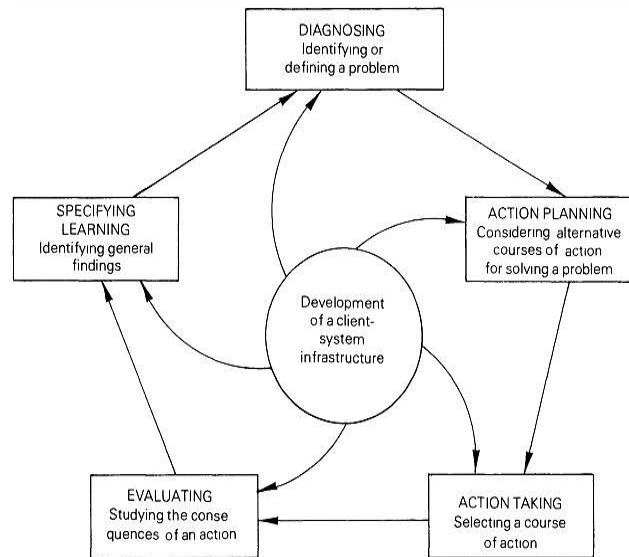
Table 3-2. Groat and Wang's tripartite framework of research paradigms (Reprinted from Groat & Wang, 2002, p. 32)

	Objective ←————→ Subjective				
	Positivism/Postpositivism		Intersubjective	Constructivism	
Epistemology	Knower distinct from object of inquiry	Knowing through distance from object	Knowledge framed by understanding sociocultural engagement	Knowledge co-constructed with participants	Knowledge perpetually provisional
Ontology	Assumes objective reality	External reality revealed probabilistically	Diverse realities situated in socio-cultural context	Multiple constructed realities	Infinite realities

Epistemological intersubjectivism suggests “knowledge framed by understanding sociocultural engagement” (Groat & Wang, 2002, p. 32). Simply speaking, it describes a concept of “design as research” (Groat & Wang, 2002). Traditionally, research is referred to as scientific work. It pursues a theoretical ideology but lacks applicability. On the contrary, design is viewed as a subjective, individualized and intuitive process, which contains little academic credentials. In intersubjective epistemology, “design” emphasizes “courses of action for generative production of figural schemas that lead to built forms” (p. 101) One major feature of the action lies in information-feedback loops. According to Groat and Wang, the feedback is initiated by “evaluation”. Practitioners such as architects and consultants not only make decisions as players of a project but also assess and evaluate decision from theoretical perspectives. Here, evaluation is not limited to post-occupancy evaluation (POE) that only provides pre-and post-data collection (Groat & Wang, 2002). It is also involved with design action that is shaped and reshaped by designer’s learning through assessment and collaboration of multiple disciplines. Susman’s (Susman, 1983) model of action research can capture some of the concepts (Figure 3-3). Her model of action research has five phases: diagnosing, action planning, action taking, evaluating, and specifying learning. Information-feedback loops start with an evaluation. Evaluation results would

shape future planning and action taking as well as a client-system infrastructure (interactions between clients and researchers) in (re)formulating these five phases. Groat further argued that practitioners in this framework serve as “cultivators” (Groat and Wang, 2002, p. 117), encouraging teamwork, interdisciplinary collaboration for a solution, and engagement of social and cultural milieu.

Groat and Wang’s approach to some extent remains abstract. It lacks theoretical explanation of why action is knowing. It needs clarification of processes/steps of a design-as-research approach. Although Susman’s action-research diagram aids



*Figure 3-3. Susman’s action-research diagram
(Reprinted from Susman, 1983, p. 95)*

understanding of “design as research”, two issues still need to be addressed in her model. First, Susman’s diagram has only one-way loop. It suggests a less flexible and responsive action research model. Second, it lacks explanation of how input of architectural research influences practice. Seven architectural research strategies including historical, qualitative, correlational, logical, simulation, experimental and case study methods are detailed by Groat and Wang (2002); they are worth discussing in their roles in action research.

2. Reflection on Fishman’s model

Although Fishman’s model is originally developed for psychology, it seems help orchestrate Groat & Wang’s concept of design as research. As shown in Figure 3-4, Fishman’s pragmatic model easily captures their central ideas. In Fishman’s framework, an architecture project is viewed as a social program, aiming to solve client’s problems. Client’s conditions are assessed through different types of

architectural research (Groat & Wang, 2002) or environment-behavior studies (Weisman, 1983a), which are guided by practitioner's experience and theories characterized by systemic and multivariate thinking.

Architectural programming in this model is an approach to understanding client information in figural concepts (Groat & Wang, 2002). Traditional architectural programming has some issues (Weisman, 1983). For example, it has limited impacts on on-going design processes (Groat & Wang, 2002) and lacks flexibility of serving as a vehicle for application of environment-behavior research (Weisman, 1983). On the contrary, programming in this model is application of theoretical and practical concepts, and encourages involvement of different parties and stakeholders. It requires collaboration and negotiation to achieve consensus and shared goals (Fishman, 1999).

Architectural programming implies planning, design and other actions. If results of action are insufficient, further cycles of reprogramming continue until a satisfactory outcome is achieved. The feedback loop reflect Windley & Weisman's (1977) idea about a spiral-like process between evaluation and programming. They explained, "...the decision-making sequence, from formulation to implementation, is actually cycled through many times throughout the design process" (p. 17). Results

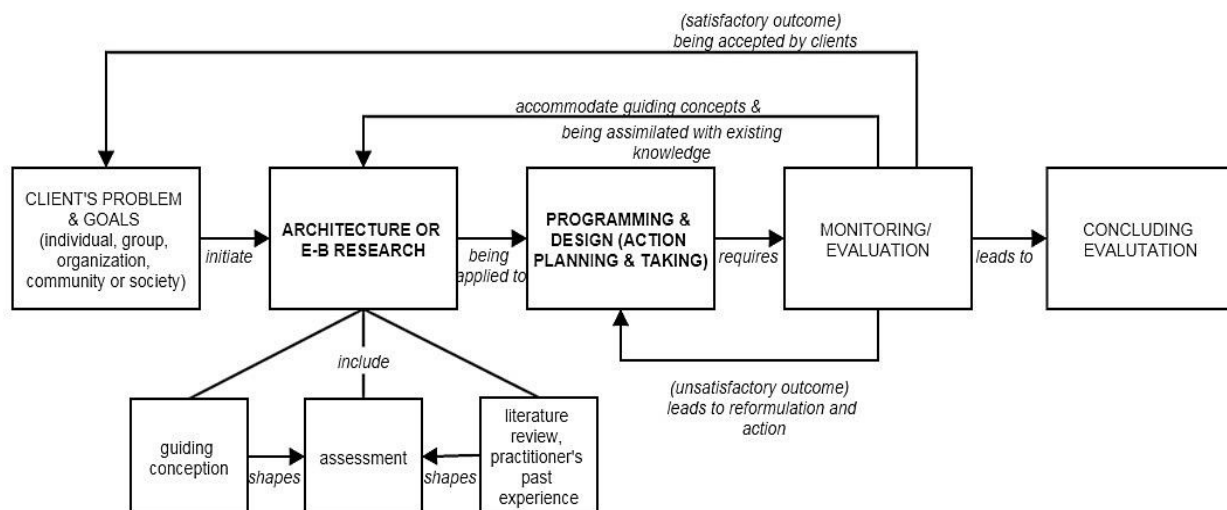


Figure 3-4. Architectural research as practice. Modified from (Fishman, 1999, p. 11)

of design evaluations complement architectural theories and practitioner's existing knowledge, and continue shaping next steps and inspire new ideas of research.

II. Systemic Theories

According to Fishman, theories that can guide a pragmatic inquiry are systemic and multivariate. In the field of environmental psychology and environment gerontology, several theories serve well for that purpose. They provide holistic conceptualization of P-E relationships sequentially. These theorists or thinkers include Barker (1968), Moos (1981), Canter (1977; 1991) and Weisman (1997b; Weisman et al., 2000). They share the same philosophical origin—Aristotle, and have overlapping interests related to Egon Brunswik's (1943; 1955) ecological environments.

Table 3-3 shows comparison of these theories or models. A simple evaluation was conducted to understand the variety of topics that each of the scholars deals with. Results of comparison suggest that systemic theorists like Canter and Weisman have much integrative and inclusive approach. Most of the systemic theories are influenced by Aristotle's study of soul's capacity including perception, thinking, emotion and desires-related actions recurred in their studies. Casey's approach on place is oscillated between Aristotle and Merleau-ponty. He keeps his theory in a degree of vagueness by accepting Aristotle's view of place as container and also admitting that place as event of taking actions.

Table 3-3. Comparison between systemic thinking, constructivism and positivism of P-E relations. To highlight the uniqueness of the systemic school, Cresswell's (1996) research on radical constructionism of place, Casey' (1997; 2009) Aristotelian-Merleau-pontian approach to place, and Berlyne's (1960) study of experimental psychology are added into comparison.

	Aristotle	Brunswik	Barker	Moos	Canter	Weisman	Cresswell	Casey	Berlyne
Perception & environmental variable	●	●	×	◐	●	●	×	●	●
Cognition /imagination /Fantasy	●	●	○	◐	●	●	×	●	×
Goal-oriented action	●	◐	●	◐	●	●	●	●	×
Emotion	●	×	×	◐	○	○	×	●	●
Subjective interpretation & meaning assignment	○	◐	×	×	○	○	●	●	×
Preference and environmental quality	○	×	×	●	●	◐	×	×	●
Purposive evaluation	×	○	×	◐	●	◐	×	×	○
Phenomenal environments	×	◐	×	×	×	○	●	●	×
Consensual environments	×	◐	●	●	●	●	●	○	×
Objective environments	●	●	●	●	◐	●	○	●	●
Public/political environments	×	×	×	×	×	×	●	●	×
Ecological (Gestalt) approach	×	●	●	●	●	●	×	×	×
Total	18	21	5	22	25	25	16	25	13

● direct and great emphasis: 3 points; ◐ direct but little emphasis: 2 points

○ implicit and little emphasis: 1 points; × no emphasis: 0 points

The next sections will first review Aristotle's psychology (pre-modern concepts) and Brunswik's probabilistic theory. Following that is in-depth analysis and comparison of the four systemic models.

A. Aristotle's psychology

Philosophical discussions of systemic thinking can be traced back to Aristotle (384— 322 BC) (Canter, 1991). From his perspective, phenomena consist of 1) the mind and the sense (people), 2) the knowable and sensible (objects), 3) capacities of the soul (psychological processes) and also 4) organization of soul-body relations (rules). These four components and interactions between them form an interrelated system.

Aristotle introduced these concepts in his book, *De Anima*, which investigates the soul in terms of its relations with body and its capacities related to perception, imagination (*phantasia*), thought, emotion and desire (Caston, 2009; Matthews, 2008; Stanford Encyclopedia of Philosophy, 2008). He sees the soul-body relations as matter-formism or hylomorphism. In Caston's (2009) explanation of the relations, "The parts and materials that make up a concrete object are its matter, while the way they are organized into a whole that can function in the appropriate ways is its form." (p. 318) In Aristotle's mind, the soul is the first actuality of a naturally organized body, and the body is organized in a specific way in light of the soul's capacities to engage in activities for nurturing the body and become alive (Trott, 2013). There seems invisible force to regulate the soul- body relations toward conditions of perfect functioning (Altman & Rogoff, 1987).

From Aristotle's perspective, the soul and body is thus not completely separated or merged but they are interdependent in certain ways. This concept, as commented by Caston (2009) and Matthews (2008), is an alternative paradigm to Plato's soul-body dualism (i.e., physical body and soul are separate entities and soul could exist after the death) and materialism (i.e., everything is made of matter or depends on matter —there is no soul and the mind is the brain.). It is a functionalist and teleological conception of the world.

In such framework, activities of the body are goal-oriented. They are involved with intrinsic motivation (e.g., appetite and desire) to nurture the body and enhance soul's capacities. As explained by

Aristotle, human action aims at some good—flourishing. It satisfied needs related to biological functions of human (*nutritive principle*) and soul's capacities in terms of passions, emotions and cognitive thinking (*appetitive principle & intellectual principle*)(citation) . “Activity” is thus embedded with practical interests and values of individual (May, 2010).

To Aristotle, discussions of action can never be moved beyond capacities of the soul (e.g., perception, thinking, appetite, emotion etc.). According to him, there are two important agents: the mind and the sense as well as the knowable and sensible, in exercising the capacities. The mind and the sensory faculties have capacities capable of knowing/understanding the world, and capable of being affected. The knowable and sensible are objects with universal characteristics and with knowable and sensible forms; they have capacities capable of acting upon mind and the sense.

Aristotle's discussion of soul's capacity includes many details of psychological processes. Overall, it contains two significant notions. First, it suggests that different capacities like perception, cognition, imagination, and emotion are interrelated. For example, perception is inseparable from cognition. Aristotle's account of incidental perception (e.g., perceiving white things as the son of Diares) is argued to be involved with inference, imagination and evaluation (Caston, 1996; Owens, 1976). Also, Aristotle argued that emotions such as anger are involved with cognition because thought or belief is essential to emotion (Fortenbaugh, 2002).

Second, Aristotle's description of action is built on representation and also sensory experience (Caston, 2009). On one hand, he concludes that it is human's desire and appetite that initiates movement (Stanford Encyclopedia of philosophy, 2008); people have actions to “satisfy some craving” (Robinson, 1989, p. 80). On the other hand, he found action is motivated by imagination, evaluation and practical reasons; people act to resolve a problem (Robins, 1989).

B. Brunswik's ecological environments and probabilistic theory

Brunswik (1943) proposed a concept called “ecological environments” to fill the gap between two psychological research paradigms: nomothetic (or law finding) and idiographic (or individual events).

The concept of “ecological environments” is a molar description of people’s interaction with environments. It is different from traditional psychology that neglects organism-environment relationships as whole and limits focus on either the organism (human or brain alone) (Kirlik & Storkerson, 2010) or physical environments (Brunswik, 1955). He argued that relations between organism and environments form a feedback loop. They are shaping and shaped by each other. Interactions from either direction are ambiguous and imperfect (Brunswik, 1943); sensory organs never accurately perceive stimulation. The ambiguity is reduced when people comes to a probabilistic and functionalist “estimate” of the reality. “Such a probabilistic judgment may be thought of as a “best bet” or an “educated guess” about the true nature of the environment.” (Holahan, 1982, p. 39) Kirlik & Storkerson (2010) commented that an underlying assumption of Brunswik’s probabilistic thinking is pragmatism because ultimately, taking the best bet is to succeed, survive and solve problems. Human experience is the basis of validation of the “bet”. People test and investigate accuracy of their guess by taking actions upon environments and evaluating functional consequences (Holahan, 1982). Accumulation of experience helps build up “a repertoire of probabilistic statements” about environments. (Holahan, 1982, p. 39)

Environmental cues, from Brunswik’s perspective, are linked with different levels of ecological validity— degree of probability in estimating the reality. Human ranks “hierarchies in accordance with the degree of probability by which they are linked, in both causal directions, to the respective distal variables, and classified accordingly as “good”, “misleading”, etc.” (Brunswik, 1943, p. 257) In other words, human stores information and establishes a “database” regarding probability of environmental

cues and its functional consequences. To achieve a stable and successful interactions, people pay attention to and select particular objects, events or properties that signify (Kirlik & Storkerson, 2010; Wolf, 2005). The concept is similar to James's idea of "selectivity", which describes human's attention on particular patterns of environments with strong practical values.

According to Holahan (1982), Brunswik's approach highlights an active role people play in interpreting environments, and inspires Adelbert Ames to develop transactional psychology, which focuses on its inter- or intra-subjective interpretation of environments.

Another development of Brunswik's probabilistic functionalism went into a different direction. Carolyn Sherif and Muzafer Sherif's (Sherif & Sherif, 1967) Social Judgment Theory (SJT) addresses human judgment in social situations. Although the theory focuses on individual's internal processes of judgment of social information, it seeks to understand how likely people evaluate other people's ideas (acceptance, rejection and noncommitment), and how probably they change attitudes with incoming information. Its underlying notion is that individual internal perception is assimilated, confirmed, validated or rejected by other people, suggesting that individual's judgment is subject to social change, an extra-personal level of interactions with environments. One may argue that Brunswik did not really target the sociality of perception; however, his theory well served as foundation of P-E research beyond a micro-level.

Brunswik's theory is often compared with Lewin's field theory, which addresses "subjective probability" — expectation or estimation of psychological or personal interactions with environments. Lewin argued that people and their environments depend on each other; to understand behavior, one has to examine a totality of coexisting factors and conditions. Lewin mentioned, "To understand or to predict behavior, the person and his environment have to be considered as one constellation of interdependent factors." (Lewin, 1946, p. 338) While Lewin is more interested in subjective life, Brunswik seems to accept an objective or consensual level of reality (Hammond, 1998).

C. Systemic model: Barker, Moos, Canter, Weisman

Comparison of the four systemic theories is created in Table 3-4 based on Weisman's (Weisman, 1997a) approach to analysis of systemic models of P-E relationships. Barker (1968) made a distinct step from Brunswik's ecological environment by emphasizing "order" and behavior prediction in perceptual environments. Canter reveals social rules in explaining human action, which differentiates his theory from Altman's approach to social behavior. Following Lawton (1986), Moos (1981) and Weisman (1997; 2000) provide more definite environmental classification. Embedded with pragmatic thinking, their work has a great influence on research which addresses complex relationships between institutional environments and older adults.

Table 3-4. Comparison of systemic models proposed by Barker, Moos, Canter and Weisman (Developed based on Weisman, 1997, p. 326)

	Barker (1968)	Moos (1981)	Canter (1977, 1991)	Weisman(1997; 2000)
<i>Physical</i>	Milieu	Physical and architectural features	Physical parameter, cognitive/perceptual properties of physical environment	Physical settings: spatial properties, built features and sensory properties
<i>Individual</i>	n/a	n/a	Environmental roles	Individual residents/clients
<i>Group</i>	n/a	n/a		Family or staff group
<i>Organization</i>	Suprapersonal	Suprapersonal		Organizational context
<i>Rule (explicit or implicit)</i>	Coded program	Policy and program	Place rules	Program
<i>Conflux of P-E relationships</i>	Behavior settings	Social climate	Place experience	Attributes of place experience

n/a: not available

All of these models concern about three basic components: people, physical environments and rules, and make an attempt to describe convergence of these components. However, each of them varied in emphases on subcategories of the components and creates a particular angle of view (Figure 3-5). More specifically, both Moos and Barker are interested in behavior of social aggregate and rules of place. The former focuses on institutional settings and the latter community environments. Differently, Barker applied an “outside-in” approach. By understanding observable behavior and its context, he reveals objective and consensual environments (i.e., physical objects and rules). Moos provided a detailed discussion of physical environments rather than a general concept (e.g., Barker’s milieu) and revealed experiential aspects of environments (e.g., cohesion, independence, physical comfort, etc.).

Canter has a more delicate way in dealing with social aggregate. He is interested in socially-agreed rules and expectation related to particular social roles. He argued that they are consensus of how people act appropriately in a place. He admits that conflicts exist between different social expectation, and social values change over time so he acknowledges the importance of negotiation in solving conflicts. In Canter’s model, physical environments have evaluative qualities. They are cognitive

and perceptual aspects of environments, and related to people's satisfaction of a place. However, Canter's discussion of physical environments remain in a general concept; it is absent from taxonomy.

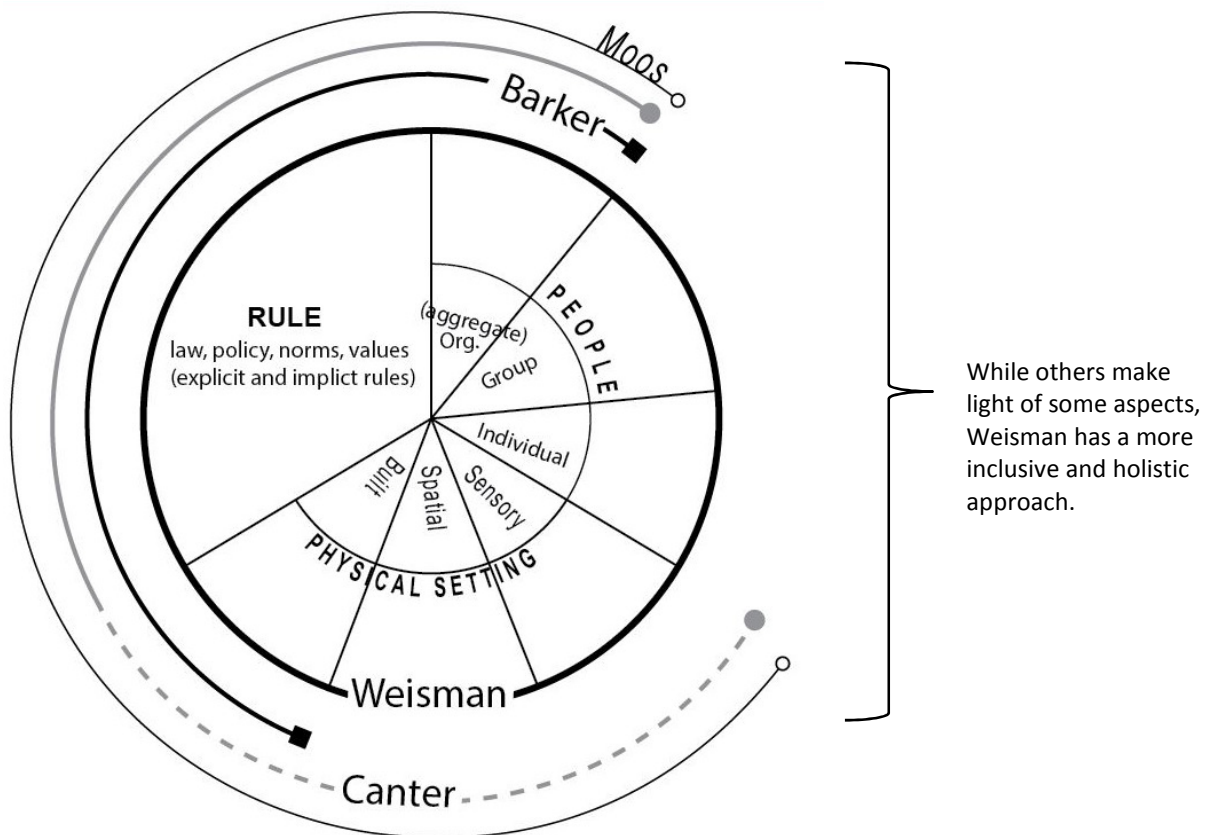


Figure 3-5. The angle of view derived from the four systemic models

Weisman consummates the work of Barker, Moos and Canter. In terms of physical environments, both evaluative and non-evaluative properties are emphasized by classifying environments with sensory, built and spatial domains. In terms of people, Weisman adds dimensions of “individuals” and “group” to cover various meaningful levels of consensual and phenomenal experience. Weisman conceptualized results of P-E interactions as place experience. It is not kept as a theoretical idea but is actualized in experiential attributes. The attributes suggests specific patterns or summaries of

people and their activity in a specific physical setting. The patterns serve as references of understanding a place's personality and act as a roadmap of improving existing place experience.

1. Barker's Behavior Settings:

An ecological approach:

Barker (1968) has little interest on individual psychological reactions to experimentally-controlled stimuli. What attracts him is behavior of people en masse in real-life settings, or in Barker's term "ecological environments". There are three differences between Barker's and Brunswik's ecological environments including aggregate behavior, regularity of perceptual environments and behavioral prediction. From Baker's view, there is direct behavioral consistence cross people guided by control circuits or self-regulation mechanism; understanding the mechanism allows people to predict or describe environments. Barker argued that Brunswik's ecological environments disallow prediction because individual's "best bet" of environments does not promise generalization; prediction requires empirical investigation in each case (Barker, 1968). However, Barker's comment is based on the assumption that Brunswik's probabilistic estimation is moved beyond a pragmatic context. In fact, Bunswik pointed out human built database of 'what works best' in terms of probability of environmental variables; behavior prediction may came from desire of pursuing stable and maximum functioning.

Barker's (1968) ecological environment has five major features: 1) naturalistic and objective properties; 2) consistent molar behavior, 3) temporal relations between behavior and behavior settings, 4) definite boundary and 5) rules/laws that guide behavior, each of which and relationships between them helps maintain stability of settings. He argued that people's behavior is shaped by its ecological environments rather than personality traits; people en masse behave consistently no matter what internal psychological states they have. In his example, a ball game is an ecological environment that comprises players, space, furniture, rules of the game as well interactions between them. In similar ball

games, there is remarkable similarity among player's actions. As described by Moos (1976), Barker's ecological approach recognizes both physical and social context; it enables us to deal with extra-individual environments and to conceptualize people and environments as a whole.

Behavior settings

Barker theorized "behavior setting" as a study unit of ecological environments. According to him, it has the same properties of ecological environments. More specifically, behavior settings are limited within self-generated boundaries. Behavior in behavior settings is not random and intuitive; it is guided by laws or rules that lead settings to a stable status (Wicker, 1984). Some patterns of behavior that have unique temporal-spatial profiles are "standing patterns of behavior". They are "specific sequences of people's behavior that regularly occur within particular settings" (Schoggen, 1989, p. 3). For instance, people sitting and facing to a podium in a class is not going to be found in a school office or after the class is dismissed. Their pattern of behavior is not dependent on a particular person or group but by rules of the school and class; as new students come, they behave in the same way.

Non-behavioral phenomena in behavior settings are referred to as milieu. They include human-made and natural surroundings, which are objective, independent of people's perception. Milieu encloses behavior and form temporal-spatial consistency, or in Barker's term "synomorphy" with behavior. Gump(1974) explains synomorphy as "a fit between behavior and physical environments" (p. 269), in which standing patterns of behavior is effectively operating. In a setting of worship service, chairs and audience facing a pastor and his lectern, from Barker's perspective, is a synomorphic phenomenon. Synomorphic relations are also products of rules. Arrangement of furniture and spatial layouts is coded specific to a setting.

Wood & Beck's (1990) research on family rules and behavior supports Barker's concepts. They conceptualize a family room as a field of rules that shape occupants' behavior, experience, and meanings. In the article, rules related to a screen door or doors are analyzed in particular. They are

explicit rules that parents communicate with children about Do's and Don'ts, aiming at keeping children from tearing down the house (i.e. making a stable environment). Some of the rules like "Don't slam the door" "Don't push on the screen" and "Don't push things through the holes in the screen" reflect such aspect. Based on Baker's theory,

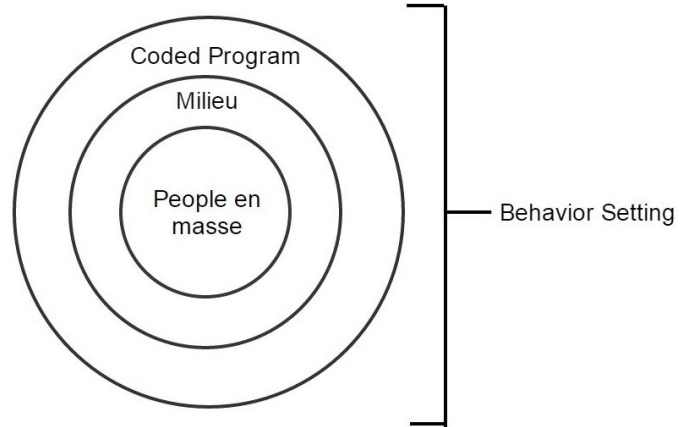


Figure 3-6. An attempt to outline concept of behavior setting

the room in Wood & Beck's study is a behavior setting with a clear boundary. Specific rules guide several outstanding patterns of behavior like "people closing the door every time they go through". They also guide placement of physical objects and temporal sequence of movement. Wood & Beck (1990) explained, "These rules are a form of the room...and the room is an expression of values." (pp. 4-5) In other words, knowing the rules of a room is in some sense knowing the room.

Barker's behavior setting is an approach to knowing a place. Rules that guide behavior patterns and synomorphic relations become "genotype" of that setting. Different behavior settings with same codes (e.g., game rules or organizational programs¹) are classified into the same genotype. Environments with more genotypes means there is more diverse and rich molar behavior (Barker & Gump, 1964).

Advantages of behavior settings

According to the above discussion, concept of behavior settings can be outlined as a donut model (Figure 3-6), suggesting enclosure quality and hierarchical relationships among coded program, milieu and behavior of people en masse. One advantage of this model is that it provides an approach to

¹ Barker (1968) did not really define what "coded program" (p. 80) is. In his description, it is closely related to explicit rules such as rules of a ball game, organizational mission or tenet in a church's statement (p. 81-82). Implicit or unconscious rules are not discussed.

describe environments as a whole. It is holistic because it consists of human consensus behavior, physical environments and social environments in terms of explicit rules like codes and organizational programs. His concept of behavior settings allows Liu (1994) to define research boundaries of street life in Taiwan and identify standing patterns of behavior in both new developed and old streets. Liu further included both explicit and implicit rules of behavior settings and argued that acting according to codes is the result of interpretation of cues (milieu and human behavior); from her view, consensual behavior is caused by shared understanding of the cues, which arises from processes of enculturation.

Another advantage is that the model contributes to development of setting typology. Barker (1968) developed a standardized form to identify genotypes of behavior settings. His attempts of developing setting taxonomy has

practical and theoretical importance (Moos, 1976). First, taxonomy implies generalization and allows prediction of behavior patterns before design, and theoretically, it can be viewed as organization of concept, which helps theory construction.

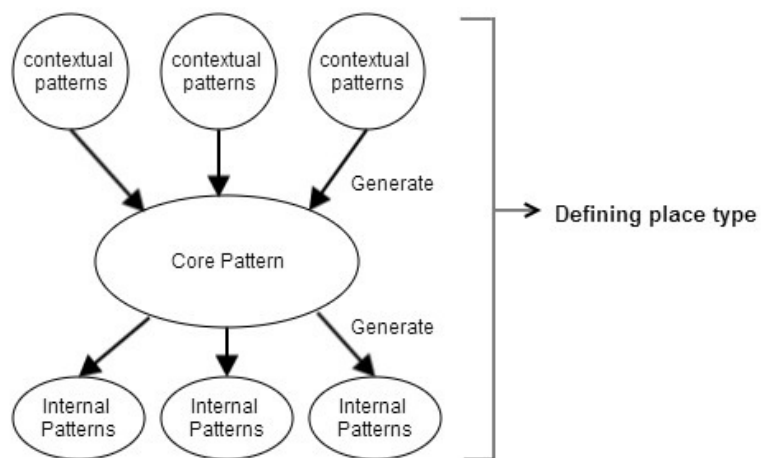


Figure 3-7. Cluster of patterns for a place. Reprinted from Silverstein & Jacobson (1985, p. 153)

However, it seems inadequate to establish taxonomies with only the concept of behavior settings; there is a fundamental need to define and distinguish different types of coded programs in Barker's study (Moos, 1976).

Rules or codes play a central role in Barker's model. However, Barker gave no definition of them. Rules or codes emphasized by Barker are explicit. Implicit orders are overlooked. A concept of "hidden program" proposed by Silverstein and Jacobson (1985) may aid Barker's model in defining genotype.

Based on their study, a setting is programmed by a system of relationships/patterns; these relationships are usually taken for granted, and not as obvious as those in Wood and Beck's research on family rules. These relationships are unconsciously accepted by society and quietly shaping spatial arrangement, forms of social interactions and attributes of experience.

Silverstein and Jacobson (1985) divided the relationships into contextual, core and internal patterns (Figure 3-7). Contextual patterns reflect characteristics of a large society as a whole. If we take nursing home industry as an example, they may include growth of aging population, healthcare policies and state budget that control distribution of medical resource. Shaped by contextual patterns, core patterns are the fundamentals of a place. They give basic definition of a place. In a nursing home, its core pattern may comprise 24-hour open nursing stations. A common dining that provides three meals a day, private or semi-private bedrooms, and a multiple function room for group activities. Internal patterns are generated by core patterns. They describe instrumental organization of a place. For example, movable chairs are placed to accommodate different social groups, and a curtain in a semi-private room is installed to reduce visual invasion.

The three patterns are social-physical forms, guiding physical environments, spatial behavior, value and belief of a place. It provides more in-depth descriptions of coded programs, which may help identify and distinguish among behavior settings.

2. Moos's Social Climate

Approach of social ecology:

Moos elaborated more social aspects of human behavior than Barker. He called the perspective, "social ecological approach" to distinguish his study from Barker's (Moos, 1976, p. 28). Unlike Barker, who points up hierarchical relationships between rules, milieu and behavior, Moos (1974) conceptualized human environment as a system with distinct subsystems that comprises both physical and social properties of environments. The system has six parts including 1) geographical and

meteorological level, 2) architecture and physical design, 3) behavior settings, 4) organizational structures, 5) psychosocial characteristics and organizational climates and 6) personal and behavioral characteristics of individuals, which “are inextricably related and must be studied together” (p. 29). These properties address objective, social, behavioral and experiential aspects of environments, indicating Moos’s inclusive intention of theoretical development.

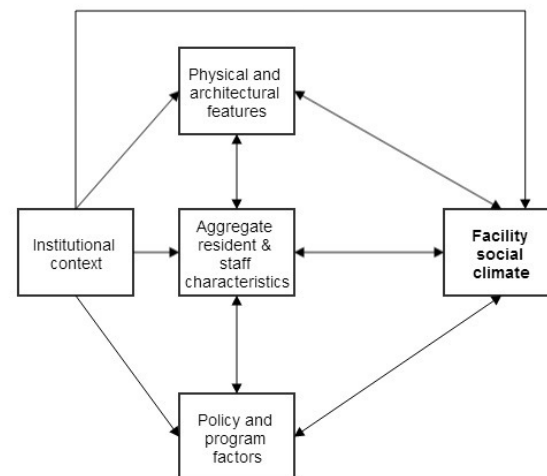


Figure 3-8. Moos’s model of social climate.
Reprinted from (Moos, 1981, p. 7)

Social climate: Setting experience

Moos (1974) assumed that “environments, like people, have unique “personalities” (p. 12). Personality of environments, or as Moos called it, “social climate” serves as a setting’s identity or distinct attributes that allows recognition and classification. Social climate measures aggregate people’s “subjective appraisal of their environment “ rather than individual interpretation of settings (Moos & Lemke, 1994, p. 89) it taps users’ global environmental experience.

Moos’ measure of aggregate characteristics corresponds to Lawton’s description of “suprapersonal environment”², which aims to understand consensual aspects of activities and meaning. According to Lawton, the consensus can be used as foundation to establish or improve attributes of activity program, care delivery or other social service, and create better practice. Lawton’s Press-Competence model (Lawton & Nahemow, 1973) is embedded with such concept. Consistent patterns of

² According to Lawton (1983), suprapersonal environment suggests “the modal characteristics of the aggregate of people physically proximate to the person, who may or may not have some personal relationship to that individual” (p. 62). Age characteristics and educational background are examples of suprapersonal environmental characteristics. Lawton further explained, “The degree of congruence between a personal characteristic and a corresponding suprapersonal characteristic constitutes a transactional aspect of the suprapersonal environments” (p. 61).

interactions between press and competence allow healthcare profession to make decision in caring older adults. Although Lawton's model is criticized for simplifying complexity of P-E relationships (see Figure in Chapter 2), its pragmatic significance never comes passively because the model seeks workable patterns (fits between press and competence) with a high probability of better health outcome, which, from Fishman's perspective, is essence of pragmatism.

Moos's conceptualization of social climate evolves with his continuous research effort on older adults' living settings. In his later study (Moos, 1981)(cf. Moos, 1976), environments are viewed as resource systems that consists of five domains: 1) setting context; 2) physical and architectural resources, 3) policy and program resources; 4) aggregate resident and staff characteristics and 5) social climate. According to the model, the former four subsystems contour social climate which in turn shapes these subsystems and people's behavior and experience (Figure 3-8). A major purpose of this model is to understand the social climate and to identify environmental determinants that "maximize "desirable" behaviors (and presumably minimize "undesirable" ones)" (Moos, 1976, p.320).

Social climate can thus be viewed as "outcome" in the model. Nevertheless, it is not the end of the story. Social climate feedbacks to other parts of the model and continue to create impacts. However, this feedback loop is not fully addressed by Moos.

Advantage of social climate model

From Moos's perspective, to understand the whole system, one has to understand these separate components first, and in turn, knowledge of the whole system would allow people to better describe or predict its separate components. Compared with Barker's theory, this model features definite subdivisions of a P-E system, address experience related to different social roles and highlight causality between elements. It helps categorize and organize a great amount of variables (Moos, 1981) and facilitates establishment of theoretical relationships between different elements.

Based on this model, Moos and his colleagues (Moos & Lemke, 1994) developed an assessment tool, Multiphasic Environmental Assessment Procedure (MEAP) to assess group living settings for older adults. Several items are included in each of the domains, representing environmental resources given to settings³. For example, Physical and Architectural Features (PAF) deals with perceptual, cognitive and activity aspects of physical environments. Several subcategories are included. For example, “physical amenity”, focuses on physical features that add convenience, attractiveness and comfort. “Oreintational aid” shows extent to which the setting provides features that help orient residents. Others look at activity support.

Besides, Policy and Program Information Form (POLIF) measures policies and services provided by administrators, and Resident and Staff Information Form (RESIF) measures different aspects of environments derived from residents and staff. Sheltered Care Environment Scale (SCES) measures social climate. Its indicators include cohesion, conflict, independence, self-disclosure, organization, resident influence and physical comfort. A major purpose of SCES is to understand interplay between facility’s rules and resident’s knowledge in taking actions. Residents’ experience, emotions and attitudes toward the interplay are considered in evaluation.

The MEAP was conducted in multiple group living facilities by Moos & Lemke (1994). Results were presented in correlational analysis and standard scores, which helps reveal some desirable relationships between variables and make comparisons between cases. For example, Moos & Lemke (1994) found safety features encourage residents with disability to use common space independently, and because of utilization of common areas, social interactions are promoted and thus contribute to a more cohesive organization. In their study, some cases have a much more significant gap of SCES scores between residents and staff, indicating inconsistency and misfit between actual and expected environments. Moos & Lemke (1994) argued that acknowledgment of the gap would make residents

³ More detailed discussion is provided in Moos & Lemke (1994).

and staff become involved in program planning and change since “enough persons’ cognitions may agree so that a “consensual meaning” can be established” for improving programs or service (Lawton, 1983, p46).

3. Canter’s and Weisman’s Conceptualization of Place

Both Canter and Weisman argued that place experience is the result of constellations of P-E relations. It is the center of their model and nature of phenomena. This experience-centered concept can be traced back to James’s metaphysics of experience and postmodernist thinking with emphasis on conscious experience. Canter’s place experience is of cognition; perception is embedded in cognitive processes in knowing environments. Weisman’s place experience is of perspectivism; different psychological processes of environments are acknowledged.

1) Canter’s place theory

Approach of psychological constructionism

Following Bartlett (1995), Boulding (1956) and Lynch (1960), Canter (1977) was interested in people’s internal representation of a place in early his research. Later, his studies turn to environmental evaluation in relation to cognition and preference. Canter seeks to understand how people respond to, think, feel and act in a place. His framework suggests that place as experienced is essence of P-E relationships. His model has five major components: actions, rule of place, social roles, cognition, and physical forms, each of which is inter-related. Particular patterns of these components suggest specific place experience.

▪ ***Action***

Canter used the term action (instead of behavior or activity) in his later study (1988; 1991; cf. 1977) to emphasize that human as agent with capacities in executing personal purposes. “People always situate their actions in a specifiable place.” (Canter, 1986, p. 215) He argued that people make choice and act based on their objectives. The objectives are characterized by not only individual needs but also

sociality. He exemplified Altman's privacy study (Altman, 1975) to support his argument and explained that taking an action is actually a cognitive process guided by conscious direction embedded with social significance. The significance is derived by Individuals' social roles (school teachers, father, mother or wife) given by social organizations; through conscious knowing and choosing, people understand how to behave appropriately and act accordingly and acceptably. Action to Canter is thus involved with cognitive knowing and recognition of what is socially agreed.

- ***Rule of place***

From Canter's perspective, place rules are summaries of "what is socially agreed". They are formed based on needs of building effective and functioning environments. Place rules are composed of behavior patterns guided by mixture of laws, regulation, customs and habits associated with place use (Cater, 1991). Following traffic lights is an explicit example of place rules. Taiwanese descendants worshipping a home shrine may be an implicit one. The concept of place rules is similar to Barker's term "coded program" (Barker, 1968, p. 80) or Moos's description of policy and programs (Moos, 1981), representing a set of common and known guidelines that regulate the order and occurrence of activities within a specific setting.

Canter's place rules reflect "social logical of space" (Canter, 1991, p. 198). As commented by Hillier and Hanson (1984), "The ordering of space in buildings is really about the ordering of relations between people." (p. 2) Their research suggests that the order reflects satisfaction of functional purposes and social use, in which objects and space are collectively assembled into a form that is comparable to purposive actions, and the form has social significance and can be recognized by the society. Canter further explained that the ordering of space is relatively stable because it is the results of "socially negotiated expectations of what happens in places" (Canter, 1986, p. 219). Negotiation is triggered by the fact that people have conflict purposes or interests but they want to make place use

possible. Negotiation of place rules is thus a process with participation of different social roles wanting to make sense of place.

- ***Social roles***

One of Canter's critics of Barker's behavior setting theory is there is a lack of consideration of variation between people. The variation Canter (1986, 1991) concerned is role relations to which people belong. Bhatti and Church (2000) found internal representation of home gardens varies according to social roles in a family. In most of their cases, wife's garden experience is mixed. Wives tend to view gardens as work and leisure space because they play with kids and also take care of domestic work in gardens. When they use home gardens, they feel relaxed and stressed at the same time. Husbands report that they are able to separate themselves from work duties in garden space. To men, a home garden or a garage is more like an oasis for relaxation. According to Canter (1988), social roles have significant influence on experience and evaluation of environments because roles are related to personal goals and meanings (expected status and reasons of being in place), which serves as reference of environmental evaluation in terms of whether goals are supported. In this regard, wives' experience of home garden in Bhatti and Church's (2000) is shaped by whether home gardens enhance their social roles as being a mother, house keeper, food producer, and also a person who wants to maintain a particular identity.

- ***Environmental cognition***

To Canter, environmental evaluation and recognition of place rules relies on human conceptual system or "cognitive ecology". It allows people to interpret the context of where they reside, and to act appropriately based on environmental information. Theoretical origins of Canter's cognitive system includes Lynch's study of cognitive map and legibility (Lynch, 1960), Kaplan's research on functionality of cognitive representation (i.e., clarity seeking in evolutionary advantage) (Kaplan, 1973b), Gibson's affordances (1979) and most importantly, Golledge's analysis of purposive environmental cognition in

terms of declarative and procedural knowledge (Golledge, 1991). Canter (1991) explained, “Procedural knowledge may be knowledge about acting on the world, and declarative knowledge may be knowledge about being in the world.” (p. 199) Human cognitive system serves as storage with active organization of these two.

Declarative knowledge is comprehension of who, what, when, where and how questions of a place (Golledge, 1991). It is viewed by Canter as information about “meaning of a place” or identifiable significance of environment to a person. Canter links this knowledge to Proshansky’s concept of place identity (Proshansky, 1978) and argues that it is environmental cognition playing between personal identity and physical environments. Procedural knowledge is understanding of rout-related utilization; it includes decision-making of “starting and anchor point, landmarks, distances between them, and the destination for each route” (Golledge, 1991, p. 48). Canter thinks procedural knowledge is very social in nature because it is knowledge of rule systems— the social logic of a place. It is the mechanism of regulating behavior such as interpersonal distance and territoriality addressed in Altman’s privacy study (Canter, 1991).

Both Canter and Golledge stressed that declarative knowledge (i.e., knowledge of what a place is) is the basis of procedural knowledge because knowing essence of a place is “declarative in the sense that it informs the person of who might be expected in that place ”(Canter, 1991, p. 201). On the other hand, procedural knowledge may help develop declarative knowledge. For example, in Moore’s (2000) study, essence of a place is described in composition of place rules.

- ***Physical attributes***

As compared with Moos (1981), Canter (1977; 1991) provided few descriptions of physical environments. He has no intent to classify environments but shows intertwined relationships between physical and social environments. From Canter’s perspective (1991), environments do not serve as stimuli to cause behavior but as social-physical complex to “enshrines procedural and declarative

knowledge” (p. 205). According to Canter (1991), declarative knowledge is related to meaning of a place; it describes significant interactions with environmental cues or interactions retained in cognitive map. In other words, formation of declarative knowledge suggests that environments have inherently Individual or social significance.

Procedural knowledge is knowledge of place rules that guide place use. Physical shapes and forms reflect place rules and deliver “the matrix of expectations and limitation that underlines social network” (Canter, 1991, p. 205). In Canter’s example (1988), people know and expect that a classroom is a place for learning and teaching; the knowledge is formed and confirmed by seeing other students and instructors acting with arranged chairs and a podium for lecture; when the classroom serves as a place to sleep, there may have different consequences.

Theory of place

1) Canter’s place theory in 1977

In his early study (Canter, 1977); place experience is conceptualized as transaction of conceptions, activities and environments (Figure 3-9). Conceptions describe people’s internal representation of environments including cognitive and perceptual evaluation of the settings. Physical attributes refers to general concepts of objective environments including its size, shape, forms and colors. Activities are a setting’s displayed and expected behavior. To understand place or place experience, one has to know 1) what behavior is housed or anticipated in a specific setting, 2) what physical parameters of that setting are and 3) what internal representation of the settings are hold by people in that setting. In this model, description of “social roles” and “rules of place” in making sense of place, although vague, is embedded in ideas of “activities”. “Conception” is the former idea of “environmental cognition”, related to environmental knowledge of a specific setting.

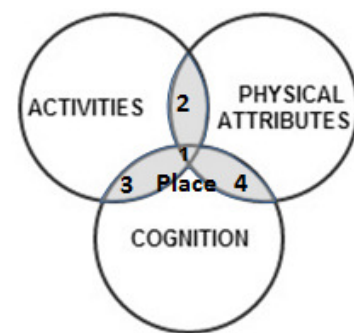


Figure 3-9. Canter's model of place in 1977. Reprinted from Canter (1977, p. 158)

In Canter's diagram (Figure 3-9), Area "1" represents conflux of the three components, suggesting place as results of interaction between activity, physical attributes and conception. Area "2", "3" and "4" are also referred to as place in his scheme; however, Canter gave no explanation of their experiential features.

2) Canter's place theory in 1991

Canter's later version of place or place experience is described as "a person's location-specific experiences" (Canter, 1997, p. 117), which is characterized by multifaceted nature of transaction between different components. In his later study (Canter, 1991); conceptualization of place became complicated with more explicit social components.

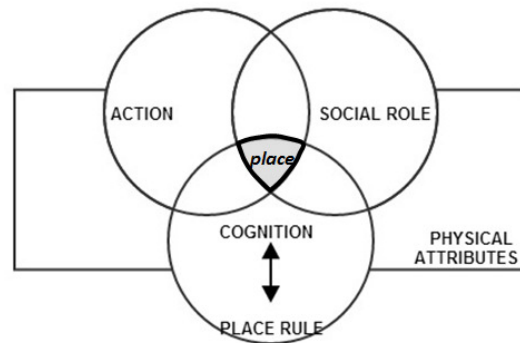


Figure 3-10. An attempt to outline Canter's model in 1991. Adapted from Canter (1991, p. 206)

Although it was not presented in a diagram, based on Canter's description, his place model is portrayed as Figure 3-10.

In this model, "place" is the result of interactions among action, social role, place rule and cognitive ecology. "Action" is important because of its underlying purposes that are formed in relation to recognition of role-related rules. "Place rules" are necessary in place experience because they reflect social logical of place derived from consensus across various social roles in acting upon and knowing the world. "Cognitive ecology" is critical because it is related to generation, store and retrieval of environmental knowledge in terms of how people act and read place rules.

Furthermore, Canter described the interaction between "Cognitive ecology" and "Place rules" as purposive evaluation. The process is related to judgment of fit between socially-agreed rules and personal goals and intentions. In other words, it is examination of whether one's purpose is supported by environments. According to Canter, results of purposive evaluation determine levels of satisfaction

with a place, which advances Kaplan's concept of preference (e.g., Kaplan 1973) or Wohlwill's (1976) idea of aesthetic satisfaction. Environmental preference in Canter's mode is mixed with perceptual, cognitive as well as social components.

Canter sees place as a unit of analysis, representing an integrated system with a molecular structure characterized by patterns of relationships between the components. It defines a place's characteristic nature. For any given place with similar sets of objectives (e.g., education settings), "there will be structural similarities in the ways in which psychological constituents are reflected in the aspects of the place" (Canter, 1997, p. 118). In other words, concepts of "place experience" to Canter allow place descriptions and also place comparisons.

Advantage of Canter's place theory

Besides Canter, scholars like Relph (1976) and Tuan (1974) also used the term "place" or "place experience" to tackle P-E relationships. To them, "place" is inseparable conflux of human and environments; it is infused with emotion, attachment and care in a phenomenological way. Focus of their approach is subjective interpretation of environments; however, objective and consensual aspects are often ignored (Bonnes & Secchiaroli, 1995). Canter's approach is inclusive and systemic; its distinct advantage came from emphasis on both physical and social environments, and from acceptance of scientific exploration of place experience (Canter, 1997).

Another advantage is that there is pragmatic value of using "place" as a unit of study. According to Canter (1997), there will be similar core aspects of places across settings with similar objectives or programming. Moore, Geboy, Weisman and Mleziva (2001) argue that once "positive" core aspects of place are found across place types, they can serve as material to restructure other places for better human experience. Canter's discussion does not go into greater depth with this respect. Weisman provides more detailed information about taking actions with concept of place.

Canter's discussion on physical environments remains general. The question of what aspects of physical attributes contribute to declarative and procedural knowledge remains unanswered. In Lynch's study (1960), five major elements including paths, edges, districts, nodes and landmarks serves as "working classification system" to examine people's image of city (Canter, 1977, p. 24). These five elements suggest there are different types of physical cues, each of which has a unique role in creating mental representation. Lynch was able to find consensual images in aggregate city dwellers and viewed it as city identity. Influenced by Lynch, Canter also emphasizes importance of physical attributes. In his model, they serve as environmental cues related to meanings of place and place rules; however, he put little effort on classifying physical cues and specifying their interactions with different social roles.

The inadequacy leads to a lack of identification of how particular architectural features correspond to specific activities, users and organizational policies, which makes his theory stays abstract. According to Moos (1974), identification and categorization is the first step of understanding a place. It helps establish common languages in describing a place type with its generic qualities. In Schneekloth & Keable's (1991) research on evaluation of library facilities, "library" is viewed as a place type. Two library cases were documented in terms of spatial organization, materials processing and technology in corresponding to their services as well as characteristics of aggregated staff and library users. Unique issues in each of the libraries were revealed on the basis of the description, and applied to development of a specific scope and approach towards evaluations.

2) Weisman's place model

Approach of pragmatic psychology

Influenced by Lawton (e.g., Lawton, 1982; 1999a; 1980), Polkinghorne and Fishman, Weisman sees himself as a pragmatist. His model of place emphasizes 1) a middle way between a separatist and relativist paradigm, 2) socially-constructed truth, 3) postmodern epistemology of practice, 4) pattern-based knowledge and 5) a mixed research methodology. These characteristics aim at revealing

instrumental meanings of knowledge in coping with things rather than representations of their intrinsic natures. Weisman viewed research and practice as “one community” (Weisman & Moore, 2003, p. 34). His model, as introduced in the next section shows an attempt of bridging theory and design; many of his efforts (e.g., Cohen & Weisman, 1991; Moore et al., 2001) have been directed toward synthesis of environmental-gerontology theories, nursing home design and practice.

Weisman’s model of place

Weisman’s studies help release the tension found in traditional environment-behavior research between 1) perception and cognition, 2) subjectivism and objectivism and 3) theory and practice. Weisman argued that the previous hydra-headed efforts (being separated from perception, cognition, action, affect and meaning) take away holistic and transactional qualities of “place”. With a pluralist position, he argues that they are all parts of place experience and should be integrated. Weisman describe place experience in terms of eight attributes including 1) safety and security, 2) awareness and orientation, 3) support of functional abilities, 4) regulation and quality of stimulation, 5) opportunities for personal control, 6) provision of privacy, 7) facilitation of social contact and 8) continuity of the self. They are summaries of previous research which makes efforts in understanding place systemically (e.g., Calkins, 1988; Regnier & Pynoos, 1992; Sloane et al., 1993; Weisman et al., 1993; Zeisel et al., 1994). Contexts of these attributes consist of a set of relationships between “physical settings”, “people” and “program”. Their roles and interactions are captured in Weisman’s (2001;1997) model of place (Figure 3-12).

1) “Physical settings” :

Weisman’s description of physical settings comprises three components: sensory properties, building systems and spatial properties. It suggests that physical environments enshrine different psychological processes. For example, sensory properties specify perceptual environments, denoting a process that sensory reactions are triggered by environmental variables. Berlyne (1960) and Wholwill

(1976) have provided detailed theoretical argument in this regard. Spatial properties are portrayed with functions of environmental cognition in creating an internal representation for spatial navigation.

Discussions of “cognitive map” gave by Lynch (1960) and Kaplan & Kaplan (1982) support such perspective. Building systems are traditional and technical views of architecture in terms of its structure, ventilation system, mechanical system and finishes. It creates physical boundaries and enclosure systems to ensure successful perceptual and cognitive responses.

2) “People”:

People comprise individuals, groups and organizations. Individuals are carriers of sensory organs, knowledge generators and interpreters of environmental meaning. Each of individuals is different in personal evaluation and subjective interpretation of environments; however, at the same time, they are characterized by some aggregated attributes. More specifically, individual behavior is not a random episode; their action is goal-oriented and is of sociality, that is, people act upon environments to maintain efficient functioning of a society (or community) as a whole or maximize socially-agreed value.

There is conscious consensus across people; it is reflected in outstanding behavior patterns or in behavior of people en mass guided by their sharing understanding of environments. Formation of consensus has practical rationale — solving environmental problems and social issues. It requires participation of and negotiation with different social roles, which, from Groat and Wang’s perspective, should be encouraged by architects serving as cultivators of dialogues. From Susman’s view, consensus is derived from a client system—“a social system in which members face problems to be solved by action research.” (Susman & Evered, 1978, p. 588) In that system, architects as inquirers collaborate with individuals, groups and organization as clients to solve problems.

3) “Program”:

“Program” encapsulates architectural, activity and experiential programming; it implies implicit and explicit rules of place use. Silverstein & Jacobson’s idea of hidden program can be viewed as implicit

rules guiding action, meaning interpretation and spatial organization. Explicit rules are policy and regulation instructing various practice and operation. Weisman utilizes concepts of “program” in two different ways: evaluation and action.

- ***Evaluation Purpose of the Model: re-reading Fishman’s example from Weisman’s perspective***

Understanding how a place is programmed allows people to describe and evaluate a place. A similar concept has been elaborated in Barker’s idea of coded program, Moos’s policy and program factors, and Canter’s place rules. An example can be found in Schneekloth & Keable’s (1991) research on library evaluation. Their first and primary focus is to reveal existing programming of libraries and know how to describe and assess a library as a place type.

Weisman’s concept of “program” perfectly fills the missing piece in Fishman’s (1999) pragmatic interpretation of educational reform in America. Specifically, different educational programs reflect particular hidden programs of education, which is associated with a certain type of architectural design and shapes learning activity and place experience.

Factory model before 1950s

According to Fishman, public schools before 1950s were developed based on a modernistic, industrial and “factory” model. It pursues “values of standardization, a rigid sense of time, and bureaucratic accountability by documenting conformance to strict rules of procedure” (p. 247). The “production line” approach creates a strong hierarchical relationship between principals, teachers superintendents and school boards, which makes students not learn something unless a teacher teaches it. Classrooms that carry this approach usually have students sit in rows of seats to facilitate management. Evaluation of class performance is decided by whether there is efficient learning from homogeneous learners in terms of their predictability and controllability. Experiential attributes of militarization of education may be described as learned helplessness, obedience and boredom.

Personal-centered model after 1960s

In the early 1960, educators in postmodernism attempted to “liberate” public school. They viewed traditional education as wasteful and academic failure, and emphasize multiculturalism, creativity and self-esteem. Tensions between critical postmodernists and modernist conservatives were described as “culture wars”. Critique of status quo of public school continues in the late 20th century. Concepts of “smart school” change nature of education programs, in which classrooms are “learning-oriented, not reaching-oriented” (p. 256). For example, teachers in smart classrooms are “more an organizer and coach of activities that provide a setting for students to learn according to their own styles and in ways that they determine to be meaningful, motivating, and relevant to their lives.” (p. 256) In other words, learning materials, studying activities and space settings are provided specific to local situations rather than to certain political ideology. Teachers in smart school systems seek to find alternatives to quantitative evaluation of student’s performance. They encourage children to use multiple materials like models or visual aids to display what is learned, and they assess their work based on individual intelligence profile. However, such approach has many challenges. For example, individualized assessment and multiple versions of curriculum for diverse background take so many efforts. Visual aids and new technologies that help individualized learning are expensive and draw budget away from other expenditure.

Pragmatic model in the later 20th century

According to Fishman, pragmatic model seeks not being caught up in the culture war. It “helps to refocus professionals on results in practice rather than the staking out of pure and highly differentiated ideological and theoretical positions” (p. 266). Scholars with a pragmatic assumption investigate “actual embodiments of educational concepts, not just the concepts themselves.” (p. 266) Unlike positivist psychologists, they study education as a particular social program, and they assess how it functions as a whole system rather than as impacts of a single variable like utilization of computers in

a school environment with assumed constancy of diverse parameters. Unlike psychologists with a radical constructivist approach, they pursue “a standardized method for evaluating every program in comparison to its equivalent peers, and then celebrate the high-achieving programs and intervene to change the low-achieving programs.” (p. 269) Following Mike Rose, an author and a former public school teacher, Fishman describe experiential attributes of pragmatic classrooms as nurturance, social cohesion, the fostering of competence, a sense of growth, a feeling of opportunity and futurity. He delineates classroom settings as a place to encourage students to be smart, to work individually and collectively and to learn cognitively and socially.

Fishman mentioned that one major task of pragmatic educationists is to “concentrate efforts on conducting systematic case studies of successful educational settings” (p. 269). They attempt to construct a database of successful cases so it can be used as guidance for program development and change among not-so-optimal educational settings. Successful cases are studied through quantitative measures and qualitative inquiry, which aims at profiling patterns of variables that works. While more and more cases are added into the database, common patterns represent a set of criteria that have been successfully adopted by groups of schools.

The three periods show distinct experiential attributes, physical settings and learning activities. They are programed with certain underlying values or paradigmatic positions. Understanding programming helps reveal essence of educational settings.

- ***Guidance of Action: place-making***

Besides its passive role in evaluation, “program” in this model has a radical or pragmatic function: placemaking. Through formulation and re-formulation of these programs, a new place type can be developed (Weisman, n.d.). Silverstein & Jacobson’s transformation from a regular American supermarket to a community market is an example.

Another example comes from Weisman's project about planning and programming an adult and dementia day centers (ADC) (Moore et al., 2001). A unique feature of his study is that attributes of place experience are applied to development of ADC's programming. As suggested by Weisman, once the desired attributes of place experience are defined for the place, they should "inform decisions in every component of place, a strategy that strengthens the relationship between the countless individual detail decisions and the implication of each choice for the place as a whole." Table 3-5 shows how defined experiential attributes shape activity and architectural programs and how architectural programs correspond to activity (functional) needs. These programs shape objective, consensual and subjective levels of environments, aiming at creating desired personality for the ADC.

Table 3-5. Weisman's application of experiential, activity and architectural programs in planning and programming an adult day care center. Adapted from Moos et al (2001, p. 27)

Components	Actions	
Environment as experienced	Define patterns linking activity and <i>desired experiential attributes</i> to the physical setting	
↓		
	Activity Programming	Architectural programming
Elderly with cognitive and physical impairments	Develop profile of population to be served (functional, social, cultural)	Describe the desired therapeutic benefits of activities in terms of <i>attributes of place experience</i>
Staff	Strategize delivery of activity program	Describe the desired facility in terms of <i>attributes of place experience</i> and characteristics of place personality
Organization	Develop activity program Craft daily activity program in terms of <i>desired attributes of place experience</i>	List the environmental considerations for activities from the points of view of participants, family, staff, and organization
Physical environment	Generate visual imagery about the place you aspire to create Collect images (photographs, etc.) that represent the <i>desired place experience</i> and reflect stylistic preferences and ADC “must haves”	Define desired relationships between spaces Define sensory and spatial properties for individual spaces Define furniture, equipment and finishes for individual spaces

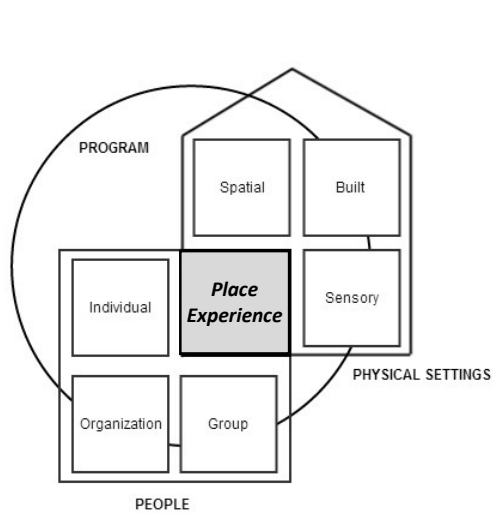
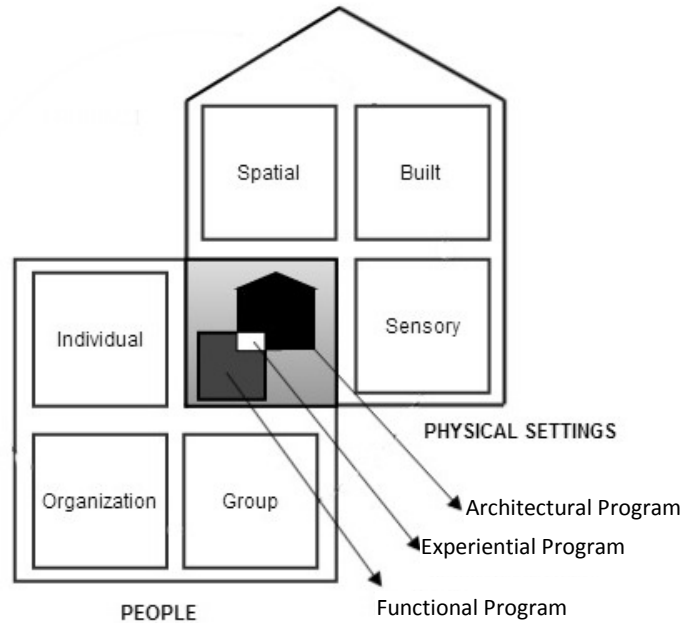


Figure 3-12. Weisman's place model.
Reprinted from Weisman (2001, p. 21)



Experiential program shape purposes and goals of functional (activity) and linking activities with architectural program

Architectural program: guidance of architectural design decision-making in terms of spatial, structural and sensory features

Functional (activity) program: decision of a range of activities in terms of participants, time, location, way of delivery and its reasons

Figure 3-11. Application of Weisman's model of place in placemaking. Reprinted from Weisman (2001, p. 21)

Figure 3-11 illustrates relationships between architectural and activity programs, suggesting how place experience is constructed or re-constructed toward programmed experiential attributes. To Weisman, programming is just one part of the placemaking process (Moore, et al., 2001). A complete development of the placemaking includes preparation, planning, programming, design/construction and evaluation. The process actually corresponds to Fishman's model that addresses professional activity as disciplined inquiry (Figure 3-2). His ideas of "preparation" and "planning" parallel Fishman's "assessment", which targets on understanding needs and issues of clients. Weisman's "programming" and "design/ construction" is similar with Fishman's "formulation" and "action" that comprise strategies of problem solving and suggest forms of action. Besides, Both Weisman and Fishman emphasize

importance of evaluation and its feedback to other steps. These emphases make the whole process continuing and evolving.

Advantages of Weisman's place model

Weisman's place model is a synthetic work. It delicately complements other systemic theories discussed in the above. As shown in Table 3-4, Weisman gives the most definite classification and definition of physical and social environments, which is inadequate in the study of Barker, Moos or Canter. This model synthesizes different psychological processes of environments. Unlike Barkers, who only focuses on behavior, and Canter, who gives primary attentions on cognition, Weisman's model integrates different modalities (perception, cognition, affect, meaning and action), giving a holistic description of place experience.

Another advantage of this model is its "one-community" approach to design and research. It is developed with a solid theoretical foundation of environmental psychology and environmental gerontology so on one hand, it can be viewed as guiding conception to provide theoretical understanding of P-E relationships and on the other hand, can be treated as a working model guiding practice or development of programs. Therefore, Weisman's model is double-or triple-barreled, solving pluralist issues in the field of architecture.

Form of knowledge that pragmatic scholars like Polkinghorne and Fishman pursue is "pattern". However, they only gave general descriptions of what a pattern is. Polkinghorne sees patterns as summary of generalization", a configuration of "all its elements and relations" to a specific situation. Fishman views patterns as organizing gestalts that give meaning and scope or a complex array of variables in understanding clients in a local situation. Weisman, based on Alexander's pattern language (Alexander et al., 1977) and Silverstein and Jacob's (1985) hidden program, explained that, "patterns, like a place itself, represent the intersection of human beings and activities that occur in conjunction with a given physical setting. A pattern is therefore like a molecule of a place — the smallest single unit

that possesses the characteristics properties and qualities of that place, but that by itself is not a place” (Moore et al., 2001, p. 29) From Weisman’s perspective, patterns are thus like building blocks connecting activities, physical settings and attributes of experience, and shaping place personality.

Weisman is looking for positive or desired “building blocks”. Alexander’s pattern language is an example of collection of “better” patterns” that help solve problems. As Alexander mentioned,” Each solution is stated in such a way that it gives the essential field of relationships needed to solve the problem, but in a way general and abstract way—so that you can solve the problem for yourself— by adapting it to...the local conditions at the place where you are making it.” (Alexander, et al., 1977, p. xiii cited in Weisman, n.d.) Alexander’s pattern language is thus pragmatic, serving as design guidance aiming at problem solving and better functioning (Weisman, n.d.). Another example of a pattern-based design guideline is elaborated in Cohen & Weisman’s (1991) study. Several desired patterns (e.g., entry and transition, shared space) are developed to help sustain focus on systems of place as a whole and guide processes of nursing home programming. The guideline implies actions of future changes in cases which are not optimally functioning. They may serve as a roadmap to establish or renew a program in a healthcare organization.

4. Comparison with human-geographic place

Early phenomenological geographers like Yi-Fu Tuan, Edward Relph and David Seamon have great influence on development of human geography. Following Heidegger and Merleau-Ponty, they are interested in discovery of essence of place (Cresswell, 2004). As discussed in Chapter II *Literature Review*, Tuan’s (Tuan, 1974) concept of “topophilia”, Relph’s (Relph, 1976) idea of “existential insideness” or Seamon’s (Seamon, 1979) description of place ballet reflects that place is “lived space”, in which action, emotion, intentionality and identity fuse into place experience. However, discussion of essential and authentic place experience cannot satisfy postmodernism scholars (Cloke et al., 1991) like Harvey (1989), Soja (1989) and Cresswell (1996), who are influenced by Marxism, feminism, Gidens’s structuration

theory and Bourdieu's concept of habitus (Cloke et al., 1991; Cresswell, 2004). A central notion of their studies is that "place" is socially constructed; human has an active role in changing it politically in terms of meaning and materiality (Cresswell, 1996). Issues of class, gender and race are primary concerns in research framed by this paradigm. Research of Cresswell belongs to this category. The radical constructionist approach is not fully appreciated by scholars like Casey (2009) and Malpas (1999), who believe that there is still something essential in place.

1) Cresswell's socially-constructed place

Cresswell paid particular attention to social dimension of place. He attempts to reveal social expectation of behavior related to a social order (structure) and consequence of inappropriate action to space. Cresswell (1996) pointed out, "place does not have meanings that are natural and obvious but ones that are created by some people with more power than others to define what is and is not appropriate...people are able to resist the construction of expectations about practice through place by using places and their established meanings in subversive ways." (p. 24) He used the term, "transgression" to suggest social struggle created by powerful groups who seek to purify space or defend the "order of things" against the dissent of "deviant" groups", who disobey the order (Cresswell, 1996, p. 21). From Cresswell's perspective, the determinant meanings or place rules are common senses or taken-for-grantedness of things about what is in place and out of place.

Cresswell's (1996) study of graffiti in New York reveals power of place in constructing and transforming painting on walls of public space between art (normality) and dirt (deviance). He found graffiti "disturbs notions of orders" (p. 42), a division of "in place" and "out of place" or self and the other. To Cresswell, discussion of where is an appropriate place to display graffiti is actually embedded with criticism of graffiti as obscene; its "otherness" is connected to an assumed city image that belongs to the third world, ethnic minorities, disease, contagion and madness".

Cresswell and other radical constructivist thinkers in geography show a great sensitivity to *difference* in place (Cresswell, 2004), while the scholars with pragmatic perspectives like Silverstein & Jacobson (1985), Canter (1991) and Weisman (2001) focus on consensus. Acknowledgment of difference may push society to recognize variation between different groups with different social-spatial experience and become a powerful force of social movement (Cloe et al., 1991). However, there seems a lack of agenda for social change in Cresswell study of graffiti; little discussion of practical consequence in terms of political agenda, urbanism or education is provided. Another feature in Cresswell's study is that he viewed physical settings as a product of society (Cresswell, 2004); for example, graffiti—painting or writing with different shapes, colors and forms—on a built feature in public space represents not only measurable objects but practice of daily life. More specifically, existence or absence of sensory, built and spatial aspects of graffiti are related to actions that people make in reflecting a particular composition of cultural, social and symbolic capital. Cresswell's description of physical settings is thus indirect and fused with portrait of social structures.

Compared with Cresswell, Harvey (1990) raised concerns of place from a global level. He argued that space and time is socially constructed. Concepts of the two are rooted in modes of production and reproduction of objective facts related to political-economic dynamics and in light of social relations. For example, nursing home gardens with plants, furniture and schedule of visits are not natural and given. They are linked with development of caring culture, healthcare policy, political philosophy and capitalism in terms of purchaser/provider split.

Cresswell's approach toward co-existence of different perspectives on place

In Cresswell's book (2004), *Place: a short introduction*, he discussed genealogy of place in terms of paradigmatic shifts in geography since 19th century. Debates are revealed between descriptive approaches (in regional geography), constructionist approaches (in radical human geography), and phenomenological approaches (in human geography). According to Cresswell, many geographers before

1960s were interested in describing physical attributes of earth surface. They often use scientific methods to understand place in terms of time and space. From 1960s to 1980s, human geographers sought to understand experience of being-in-place.

They are not interested in understand unique physical attributes of particular places (e.g., Greenland Ice Sheet) but essence of human existence (Cresswell, 2004). To human

geographers, there is essential form of “place” in different

“places”. In the late 1980s, radical human geographers, who are

influenced by Marxism, Feminism or post-structuralism like to reveal a place’s distinctive quality in terms of social processes. They argue that place is socially-constructed product and view place as “event”.

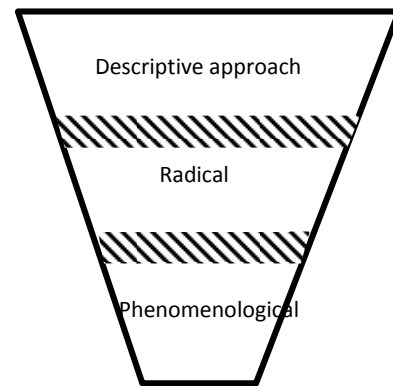


Figure 3-13. An attempt of schematizing Cresswell's approach toward co-existence of different paradigms of place

The debates of place originate from anti-modernism or criticism of universalistic place.

Cresswell's attitude toward synthesis of different approaches is vague but inclines to a possibility of coexistence. Cresswell puts it, “Research at all three levels (and the ones in between) are important and necessary to understand the full complexity of the rule of place in human life.” (p. 51) He further explains, “these three levels should not be seen as discrete sets as there is clearly some overlap between them...they represent three levels of “depth” in approaches to place with the level one (descriptive) representing a concerns with the surface of the world...level three (phenomenological) representing a deep universal sense of what place means to humanity” (p. 51) In other words, co-existence of different positions is conceptualized as an earth-layer diagram (Figure 3-13), in which phenomenological approaches are ready to reveal “inner core” of place knowledge, descriptive research specifies in the exterior of place and constructivist approaches serve as medium of connecting the two

extremes. However, Cresswell did not give an in-depth discussion of the conceptualization. It is worth discussing of how “place” as a whole is studied within such pluralist framework.

2) Casey's oscillation in phenomenology of place

Scholars like Casey (1997; 2004; 2009) and Malpas (2006) are against that place is completely socially constructed; they still look for “something irreducible and essential” in place. Malpas (2006) mentioned, “Although I may be thought to be displaying a typically “philosophical” prejudice, I would suggest that the very idea of “social construct” that is invoked by Harvey here is highly problematic, all the more so when applied to notions such as place, space, and time. Are we to suppose that the “social” somehow stands outside of place, space, and time— undetermined by them, but determining of them?” (p. 319) Malpas disagreed about the “social” in the highest priority of place and its coming before place; from his perspective, essence of place is experience of human existence (Malpas, 2006); it is a primary to the construction of meaning and society (Cresswell, 2004, p. 32).

Casey stands in a similar position but from Brockelman's (2003) perspective, he oscillates between two ontological concepts (between place as universal form and place as event). Casey's two books, *Getting Back into Place*, and *The Fate of Place*, are two phenomenological studies regarding essence of place. The former follows Aristotle's definition of place and suggests a causal relationship between place and things it contains, while the latter challenges Aristotle, arguing that place is not foundational but “eventmental, something in process, something unconfined to a thing.” (Casey, 1997, p. 337) Brockelman (2003) contended that the two books lead to contradictory conclusions; however, in my opinion, Casey embraced pluralism in understanding place.

Casey's modern language in anti-modernism

Both Casey's books dismiss modernism. In the first chapter of *Getting Back into Place*, Casey (2009) revealed how scientific concepts of time and space limit modern thinkers in understanding existence of lived experience. According to Casey, lives in modern era are “grasped and ordered in terms

of time. Scheduled and overscheduled, we look to the clock or the calendar for guidance and solace, even judgment...in this epoch of time as the primary world-order...we have come to conceive the world itself as a predominantly temporal ordering of events...When events are ordered on a time-line— just as Descartes, Leibniz and Kant all proposed (and as Galilean and Newtonian physics seemed to affirm)— then we should not expect anything other than the running down or out of these events...)” (p.7)

To Casey, space in modern philosophers and physicists is subordinate to time; concepts of space are embedded in succession of time in terms of continuity and linear timeline; in such framework, place is “position”, which consists of “a series of points arranged on the line and grasped, all together, as the line.” (p. 9) However, this time-space framework contradicts human experience. Casey explains, people speak of space as long or short with its particularity but in Newtonian conception, space is homogeneous and infinite. To get out of the impasse that “we can’t do without time, and yet we can’t live with the time we have devised for ourselves”, Casey contended that Aristotle’s idea of place may offer a way out.

Aristotle claimed that “place is prior to all things” (Casey, 2009, p. 14). From Casey’s view, it suggests that “there are no actual occasions without places for these occasions. Although there may be displaced occasions, there are no nonplaced occasions. To exist at all as a (material or mental) object or as (as experienced or observed) event is to have a place—to be implaced...” (p. 13) In other words, “to be is to be in place.” (p. 14) Following Aristotle’s definition of place as container, Casey viewed place as the limit and condition of all existing things, that is, place has boundary, providing edge of everything that holds relations of the limits. Place has power to “make things be somewhere and to hold and guard them once they are there. Without place, things would not only fail to be located; they would not even be things: they would have no place to be the things they are.” (Casey, 2009, p. 71)

Besides the concept of theoretical place, Aristotle’s philosophical place is applied to analysis of built place by Casey. To him, the “built” feature is the limit power of place in creating affiliated human

experience. In other word, people and objects within the built confines are things people associate with and are familiar with. More specifically, place's boundary ensures a sense of enclosure, rest, affiliation, and ownership. Its power of the limits allows people to know where to return and to stay or where is my (our) place. Place thus releases human anxiety of endless space-world and uncertainty, and provide stability and inhabitancy (Casey, 2009). Having a place requires special action—making or building; from Casey's view, all materials and participants create physical boundary to ensure stable human experience. Building a place is having a place to get back into.

Although human experience is the focus, Aristotle's description of place to some extent is fixed in space (Brockelman, 2003). Casey mentioned in the opening chapter of the book, ""The before and after, "avers Aristotle, are "in place (*en topoi*) primarily." Aristotle's concept of "before, now and after" reveals place's pristine quality with linear time or point-like characteristics (Brockelman, 2003; Bostock, 1999), which implies the way of movement change in space (Bostock, 1999). In other words, Aristotle's definition "allows us to understand place in more or less "spatial" term (Brockelman, 2003, p40).

In the other half of the book, Casey following Merleau-ponty argued that built place is not transformed into dwelling place unless there is lived body as orientation and inhabitation agent. Casey argued that it is the lived body that human beings have perception of spatial organization such as "up and down", "left and right", and "in front and behind". It is the lived body that human can know the world through different action organization including "constructing, inhabiting, and traveling, as well as those actions in which residing and wandering..." (p. 116). "The body is not only situated but situating." (p. 116) Casey argued that the result of body reoccupation and re-accessibility generates feelings of familiarity and rootedness, which makes built place as dwelling places. Casey puts it, " Built places, then, are extensions of our bodies...Moreover, thanks to increasingly intimate relationships with their material structures, the longer we reside in places, the more bodylike they seem to be." (p. 120) This concept

corresponds to Seamon's place ballet —a time-space routine that incorporated with habitual gestures, behaviors and actions in a particular locality to sustain certain goals through a period of time.

Inclusion of both Aristotle's and Merleau-ponty's concepts makes the book paradoxical. However, Casey skillfully integrated both ideas by viewing Aristotle's place as bound foundation or context particularized by bodily experience; he successfully utilized modern languages to outline place of postmodernism. From his perspective, to understand "place", it seems unavoidable to penetrate or go through universal senses of place. His synthetic approach suggests that denying either one of them makes understanding place impossible and thus "wins an alternative theoretical language to that of modern science, with its emphasis upon causal sequence." (Brockelman, 2003, p. 39)

Casey's place as event

In a Casey's later book (1997), *The fate of place*, however, rejects Aristotle's definition of place and leans toward theories of Foucault, Derrida, Irigaray and other postmodern thinkers. The major theme of this book is discussion of a taken-for-granted and fallacious inference of time and space offered in a philosophical history; Casey pointed out, "...but to reaffirm the importance of place we need not posit its privileged status in the manner of Aristotle, for whom place is "prior to all things" It is not a matter of a new foundationalism—with Place in an invulnerable supreme position formerly assigned to God or Thought or Being...The new bases of any putative primacy of place are themselves multiple: bodily certainly, but also psychical, Monadological, architectural, institutional, and sexual...What is at state is a polyvalent primacy—an equiprimordiality of primary term." (p. 337) Casey recognized not only place's rhizomatic structure with multi-foundation but also its "present-at-hand" quality. Casey argued that the most important thing is an issue of "being in place differently, experiencing its eventfulness. (p337). Following Derrida's denial of place as essence, Casey asserted that "place is just an event, a matter of taking place" (p. 339). In such concept, a neighborhood is more an event than an entity. In other words, a neighborhood is not form by clear boundary but affiliated actions that occurs.

In such concept, place remains something that is linked or hold but the linkage becomes transformative and participatory. Brockelman (2003) commented, "*The Fate of Place* presents a distinctly postmodern view of its subject as opposed to the universalizing and pre-modern understanding offered in *Getting Back into Place*". He further explained that the two books reveal potential directions of interpreting place; people can either engage in endless argument of choosing between the two sides or admit possibility of synthesis. "To "synthesize" pre-modern and post-modern ideas of place, then, would be to imply that place is (as essence of places) and that it is not (as event-like non-essence of places)—a flat contradiction." (p. 47) Brockelman (2003) inferred that Casey's purpose is pave the way for "oscillating between them".

"Pluralistic" may be a more accurate word than "oscillating" to describe Casey's position. He acknowledges different perspectives of place and makes an attempt of synthesis. In his study of place memory, Casey (2004) divided place memory into four major forms including individual memory, social memory, collective memory, and public memory. To Casey, the four forms are distinctive but interrelated. Individual memory is phenomenological and personal; it takes place in an individual and is related to personal identity, emotion and attachment. However, Casey argued the individualistic quality is inseparable from one's social, cultural and public context because it is involved with how people internalize external worlds.

Social memory is rooted in personal relationships like family or friendships. It consists of "sharing experience" generated by intimacy and bonding; people have same history, living in the same place, and use similar means of communication. According to Casey, sharing experience suggests there are consensual value, norms and rules a group of people followed for specific purposes. Collective memory refers to "the circumstance in which different persons, not necessarily known to each other at all, nevertheless recall the same event— again, each in her own way." (Casey, 2004, p. 23) People co-reminiscing a certain event, no matter whether they are related or share group identity among them;

“the members of this momentary collectivity are linked solely by the cynosure on which their attention falls.” (p. 24) In other words, they are united by events, negative events in particular. Casey believed that John Kennedy’s assassination and September 11 are two examples of collective memory especially in the United State.

Casey conceptualizes public memory as in-between collective memory and social memory. “If individual and social memory are the two inner circles of public memory, collective memory is its outer perimeter...” (p. 25) According to Casey, public memory is the description of experience in public domain, in which “a discovery of a glaringly false part of its content” and “a reassessment of its primary significance as a wider, or simply different, ethical or historical context” (p. 29) are taking place. Public memory is formed through continuous “interchange of ideas and thoughts, opinions and beliefs.” (p. 30) In other words, people take actions to create new memory with critical thinking instead of receiving what has been manipulated by dominant economic or political institutions such as government. Casey pointed out that public memory of the Vietnam War and September 11 are examples that the public was misled by the military and government at the beginning, and many unsettled issues are still discussed and debated until today.

Following Casey’s definition, the four types of memory can be schematized as Figure 3-14. The model suggests that people’s memory of place is multifaceted, and it is meaningless to reject any of them. This concept integrates different paradigms of place memory including subjective, socially-constructed and critical remembrance of the past. It offers a path to understanding place holistically—without being locked into a static and ideological notion of place experience.

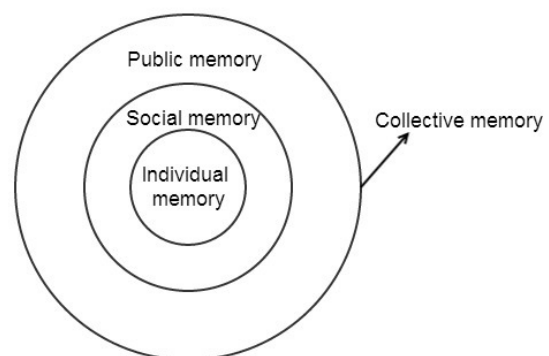


Figure 3-14. An attempt of schematizing Casey’s typology of memory

III. Conceptualization of Experiential Outdoor Environments in Nursing Homes

The previous discussion helps develop a model and conceptualize the nine experiential attributes of institutional outdoor environments concluded in Chapter 2. The model (Figure 3-15) is mostly built on Canter's and Weisman's framework. It has four underlying assumptions including 1) pragmatic worldviews, 2) ecological environments and 3) place experience as results of interactions between physical settings, people and place rules.

A. Pragmatic worldviews

This model holds a pragmatic view, arguing that research on institutional outdoor environments should not be caught up in the subjective-objective binary or modality debate (e.g., perception and cognition). This model shows no attempt of testing a theory or pursuing a certain ideology. At the same time, it avoids becoming nihilistic in social-destruction processes. The model focuses on results that help implementation of institutional outdoor environments. It can be viewed as an exploratory model, guiding descriptions of a place's personality. It is also a model of evaluation, guiding assessment of a program or comparison between cases.

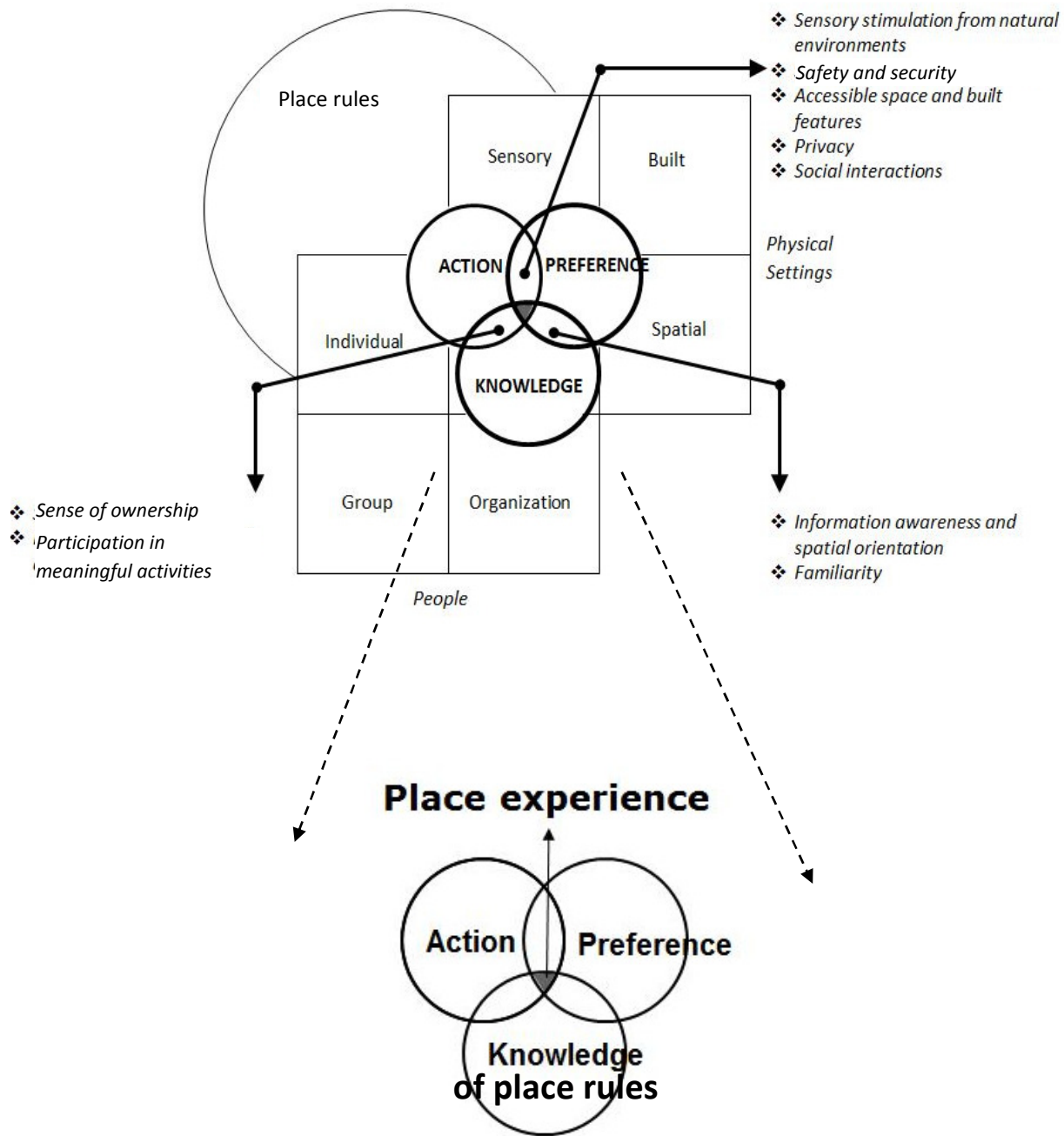


Figure 3-15. Place Model of Experiential Outdoor Environments of Nursing Homes

Based on this model, this dissertation research defines nursing home courtyards as place and describes how they actually functions as a whole system. The model attempts to provide theoretical supports of the nine experiential attributes. The purpose is to connect theories with current issues of

outdoor environments related to undesired place experience. Factors that caused less-than-optimal utilization are discussed by many scholars (Brawley, 2007; Chalfont & Rodiek, 2005; Cranz & Young, 2005; Cutler & Kane, 2005; Detweiler et al., 2012; Kearney & Winterbottom, 2005). These factors include:

- *A passive use.* An intended outdoor space is often for visual appreciation. Very few people have active interactions with the environments.
- *Low awareness of outdoor space.* Residents are not aware of a garden space. Although they may participate in outdoor activities, they forgot the space if nobody reminds them again.
- *Few activity staff.* Most of nursing homes only have two to three activity staff. A one-on-one outdoor activity is not very feasible.
- *Inaccessibility.* There are some issues of accessibility. For example, heavy pull-push doors at entries disallow wheelchair users to visit outdoor space independently.
- *No free access.* Doors to outdoor space are locked in some nursing homes. Residents have to ask staff permission before using outdoor space.
- *Safety concern.* Some outdoor space lacks maintenance; bumping pathways and rustic furniture put users in a risk. Some of them have inadequate supervision. No staff check outdoor users regularly and no technology facilitates monitoring outdoor space.
- *Vague responsibility.* Scholars have found that responsibility regarding coordinating activities, transporting outdoor users and maintenance are not clearly defined in most of nursing homes. Residents are left in a courtyard during lunch time; plants have been dead for a while without being noticed.

Some of the above issues are physical aspects of deficiency and others are managerial failure. They are associated with a low visit rate of outdoor environments and trigger concerns of cost effectiveness. Many of these problems are also discovered by Marcus and Barnes (1999b) in their book,

Healing Garden, which collects and describes several cases of institutional outdoor environments.

However, the book has no attempt to compare between cases or categorize relatively-successful outdoor settings in solving these problems. It offers few discussions of what makes each space works in a holistic context.

Given the pragmatic assumption, this model allows scholars to evaluate outdoor environments systemically. It serves as guiding conception to understand how different contexts are related to issues of outdoor settings that caused undesirable experiences.

B. Ecological environments

The model is molecular and systems-oriented. It suggests that a phenomenon is composed of a set of constellation of P-E relationships. Physical environments and people must be studied together because they shape and are shaped by each other. Following Weisman, physical settings in this model include three aspects: 1) building systems including structure, enclosure system, mechanical systems, finishes and furnishings that forms 2) spatial properties which comprise size, spatial relationships, proportion, and sustain 3) sensory properties that address strength of different sensory stimulus including light, heat/ cold, sound, texture, odors and pressure (from air flow).

Weisman's concept is employed to understand aggregate features of different social roles. They include 1) residents, 2) staff or family groups 3) organizations, each of which interacts with physical settings with shared objectives and needs. Negotiations become necessary to reach consensus about nature of a place and what appropriate actions are (Moore et al., 2001).

Aggregate behavior has to be understood within the system. According to Barker, Canter and Weisman, behavior is guided by hidden and formal programs. These programs are embedded with commonly-recognized value, knowledge and instruments that help people maximize functioning with a stable and highest probability.

Outdoor environments of nursing homes reflect the concept of ecological environments. My previous research on 14 outdoor environments may confirm the observation (Shih, 2013). A summary and discussion of the study is provided in the following sections.

1. Physical Settings

1) Building system

The 14 nursing home cases have clear boundaries, different paving surfaces, simple outdoor structure and moveable furniture.

These cases are either enclosed by walls or semi-enclosed by buildings or four-to-six-foot fence. All have a gazebo or pergola as seating and gathering space. Their patios or pathways are paved in brush finished concrete or concrete slabs, which helps to increase wheelchair accessibility. In terms of furniture, most of the cases are furnished with movable metal mesh tables and chairs. They can be relocated by family members or residents who have strong upper-body strength. Some have light plastic chairs scattered around. These plastic chairs are portable and allow for easy cleaning. They are also economical and replaceable when damaged. However, these light weight chairs are not sturdy; a broken one was found to be put aside in a nursing home garden, which suggests someone may fall from it. To consider physical limitation of nursing home residents, it is critical to select furniture that is sturdy enough (prevent tip-over injury) but also easy to move around; delicate balance between safety and autonomy for outdoor use has to be maintained.

Similar situation regarding optimal user experience were also found in a well-known garden project, “Sedgewood Commons”, a specialized outdoor space for people with Alzheimer’s disease in Maine. It is evaluated as a successful example in providing activities of reminiscence therapy (Brawley, 1997; Dannenmaier, 1995). Two issues of built features are raised. First, there is a dilemma of a trade-off between safety and aesthetic experience. One side of the garden at the beginning was enclosed by four-foot white picket fence. Residents were able to enjoy views of green fields. Later, staff found some

residents try to leave the facility by climbing over the fence so it was replaced with a six-foot fence. As a result the space has little visual connection with surrounding green space, and creates a feeling of constraint (Zeisel & Tyson, 1999). Brawley (1997) also comments on the garden and argued it is challenging to maintain safety without creating sense of confinement.

Another issue is related to optimal level of stimulation provided by bold paving patterns in the garden. It is viewed as a negative component that has minimum effects on calming agitated residents and may cause visually confusion among residents with dementia (Dannenmaier, 1995). However, from Marcus's perspective (Marcus, 1999), the patterns may provide positive visual stimulation for residents who suffer from stimulus deprivation.

Different opinions of user experience and design features may imply a series of processes: evaluation, negotiation, environmental modification and consensus achievement of desired experience among residents, families and staff members. In these steps, these built features are not only objectively described but also socially and phenomenologically experienced. A process of changing the four-foot fence to six-foot one in Sedgewood Commons may showcase concepts of ecological environments, in which discussion of built features cannot be moved beyond people and rules they follow.

2) Spatial properties

Spatial properties of the cases in terms of size, location, ratio of green-and non-green areas and visual connection are diverse. Spatial organization is related to experiential attributes like social interactions, familiarity, awareness and orientation and active activities.

Sizes of these gardens vary from 840 to 64,000 square feet. Each of the gardens has patio space for group gathering. If one wheelchair user is given 25 square feet for activity participation, most of settings have capacity of more than 20 wheelchair users. While group activities are satisfied, private social interactions are neglected. Few two-personal seating space is arranged and none of these nursing homes provide private patio connecting to resident households. Regnier (2002) argued that first-floor

private patio bounded to resident rooms may allow a more familiar and direct interaction with nature, but he found very few nursing homes in United State provide such space. Budgetary issues and safety concerns may be the reason of a non-patio layout.

Ratio of green to hard surfaces in the cases varies but most of them provide a green outlook with over 60 percent of lawn and perennial landscape. There are less than one percent of annual plants for gardening. A large proportion of law and perennial landscape suggests passive interaction with nature is preferred and encouraged; however, passive use may a result of a trade-off between safety and active activity like gardening.

All the gardens are visible from resident households. They are also visible from either dining or activity areas. It creates a spatial relationship of home settings with which residents are familiar (Cohen & Weisman, 1991; Alexander et al., 1977). Half of the cases have a linear path connecting two entries, and the linear path is a patio in itself for social gathering. The path in such design may not serve as a clear cue leading confused residents to exits. The other half has one or multiple loops with more than two entries. It is very possible that residents may feel confused and disoriented when their entry point is different from exit place (Cohen & Weisman, 1991).

These particular spatial organizations among most of the gardens suggest there are expected behavior patterns and ideological aesthetic experiences. They may be assigned by organizations or co-decided by staff and residents. In other words, a process of programming or reprograming of outdoor activity and experience was taking place to reach a certain goal or vision. Conflict goals or place uses may be solved by negotiation. It is also very likely that some people's needs are compromised. The organizing garden space thus reflects social logic of how things are operated in its nursing homes.

3) *Sensory properties*

A major goal shared among the studied gardens is to provide five-sensory experience; each of them deliver sensory-related activities has a particular way that allows accessibly, personalization and familiarity.

Aesthetic appreciation of nature is particularly emphasized among these gardens, but very ironically, an easy visual access to landscape elements is not commonly found. They are often placed lower than a wheelchair eye level so residents are required to bend body downward when checking plants. Noise control is one of major issues in some of the cases; noise from air conditioners, equipment, traffic is sometime over 60 dB and wipes out nature sounds from wildlife or water fountains. Residents have no way to reduce unwanted noise or access to quality sounds.

Staff members in half of the gardens use garden-grown food to trigger sense of olfactory. Provision of sense of olfactory usually comes along with tasting activities; staff puts herbs in meals or tea to create familiar aroma and flavors. Such experience only happens in harvest seasons when herbs or vegetables are mature. One common feature of these food-related activities is little resident involvement. Staff completes all processes from picking up herbs/vegetables, preparing food to cooking it. Although residents are informed about source of food, they hardly have chances to personalize the process or the taste.

Hospital or nursing home gardens introduced in *Landscape Architecture Magazine*⁴ or in the book, *Healing garden* (Marcus & Barnes, 1999b) have a primary focus on visual experience, although these projects (e.g., Olson Family Garden of Saint Louis Children's Hospital , Sophia Louise Dubrige-Wege Garden at the Family Life Center, Michigan) aimed at providing five-sensory experience (e.g., Hammatt, 2002; McBride, 1999). The discrepancy between what is expected and what is actually available for users may be caused by a lack of staff and organizational support in sensory activities. More

⁴ See Landscape Architecture Magazine Vol 85, 88, 92 and 93

specifically, visual and hearing experience usually comes along with passive interaction with outdoor settings, which requires less staff and organizational involvement. Instead, tactile, olfactory and tasting experience is often produced through active interaction with natural material, in which physical environments, staff, and organization have to work in coordination. This concept is one of the major notions in Kiyota's (2009) study. She found a simple task like watering plants is related to several issues in nursing homes including a poor communication between managerial level and front staff, staff negative attitude toward gardening, and a lack of prosthetic environment for residents.

2. People

Administrators, activity staff and residents have different needs and expectation related to outdoor environments of nursing homes. Their roles defined by and played in organizations shape how they perceived a nursing home outdoor setting.

An ideal nursing home garden or courtyard portrayed by administrators across homes is very consistent. It is characterized by low maintenance, passive interactions and maximized safety. In some of the homes where administrators like to directly supervise and manage outdoor settings, gardens are characterized by durable furniture and plants without too much caring efforts. Budgets for perennial (e.g., trees and lawn) are usually more than those for annual plants. Besides, activities that required body movement (e.g., gardening) are less encouraged. In other cases where activity staff has more authority and gives more direct control of outdoor settings, resident's active engagement is encouraged. Staff makes different utilization of landscape material, and residents are allowed to take care of plants, supervise and make decision related to their gardens. As a result, residents are able to apply their vernacular knowledge of plants to the current space, which makes their past life experience continued.

Residents in these nursing homes expressed that they want to have their own way to organize and take care of gardens in terms of when, where, what and how. More specifically, they have their own rules of when to water and harvest, where to grow plants and place birdfeeders, and how to attract

birds. The extent that residents can execute their control over gardens depends on how much ownership they have. However, the question of who owns gardens is not explicitly discussed in resident council or other occasions in most of the nursing homes. It is often found the notion that organizations own garden space is taken for granted.

3. Place rules

Place rules of these cases include two parts: organizational policies and hidden rules of place use. They shape how people behave and experience. In terms of policy, all the facilities clearly define availability of outdoor space and safety protocol. For example, most of the spaces are available all days. However, only six of them have an unlocked door all the time. All gardens will close if the weather is not permitting (too hot, too cold or raining). Some facilities require staff to escort residents to a courtyard or garden; as a result, garden visits become tied up with a staff schedule. Some activities are prohibited. For instance, having lunch at gardens pace is not allowed in most of the gardens nor is feeding birds with leftovers. Few nursing homes disallow placement of birdfeeders or decoration on windows.

Most of the facilities allow spontaneous and self-initiative gardening so residents and their family members are able to take care of plants without informing staff. Besides, although social interactions are encouraged by staff, heavy furniture restricts social behavior in some of the cases. Furthermore, staff does not completely follow outdoor activity schedule; they change schedule because of weather conditions or inadequate staffing.

These formal or hidden programs shape outdoor experience and arrangement of physical settings. For example, surveillance policy may influence sense of privacy by determining frequency of staff checking on outdoor residents and levels of visibility of outdoor seating. Residents who are familiar with rules of place use are “insiders”. They know how to behavior to maximize efficiency of daily life activities without breaking socially-agreed codes. For example, in some nursing homes, not many

shaded seats are available. Residents who like to meet their family in outdoor areas would occupy the space right after their breakfast before other people are still in dining rooms.

Negotiation occurs when there are conflicts between personal and consensual rules. In a nursing home, some residents save leftovers to feed birds. Several private negotiation meetings were initiated to intervene in the behavior. Although the negotiation did change the resident behavior, the quantity of meals, according to staff, did not be modified to reduce resident's sense of guilty of wasting food.

C. Place experience and experiential attributes

Weisman's place experience is synthesis of five modalities: perception, cognition, action, affect and meaning. The five modalities can be summarized into Canter's description of Aristotle's triad of soul capacities: cognition, evaluation and action. In this model, the triad is added with more perceptual interpretation of environments originated from studies of Berlyne, Wohlwill, Kaplan, Gestalt psychologists and Brunswik; it is modified as a triad of interactions among knowledge, preference and action. The purpose is to recognize equivalent of perception and cognition and to emphasize that the three processes are fundamental of place experience.

1. Preference

In this model, preference comprises two levels of P-E interactions. First, following Berlyne and Wohlwill, it describes perceptual responses to external environments. Based on their model, preference has survival values to allow people to avoid or reduce impact of adverse situations. In nursing home environments, adverse environments with noise, crowdedness, glaring floor and confused layout will lead to lower preference because of negative affect. Negative or positive affect suggests brain's neuro-reaction in relation to changes of arousal levels and aesthetic judgment. However, from James Russell's view (2003), a physiological response is only one of processes related to affect or emotion. He holds a position of psychological construction and suggests that "we abandon the assumption that emotion is a single kind of entity or process. Psychological construction thus does not offer one process as the

explanation for emotion. It does not point to an affect program, perception of bodily reaction.” (p. 82)

Concepts of emotion from constructivist perspectives comprises 1) components, 2) relationships between components and 3) the categorization of patterns of components as a specific emotion. For example, “fear” represents specific patterns of “a danger of some kind as a prototypical cause, heightened heartbeats and muscle tension, an unpleasant feeling, a facial expression that includes raised upper eyelids and dropped open jaw, an action tendency of avoidance, and a general physiological preparation for escape”(Scarantino, 2012, p. 140). The specific pattern, Russell called, “mental script” (Russell, 2003, p. 166) is basis of emotion categorization: people fear of something which “achieves enough similarity with the fear script” (Scarantino, 2012, p. 141). Preference and its related affect may thus have potential of being defined as a system.

Second, following Kaplan & Kaplan’s (1989) research on natural environments, preference is triggered by cognitive clarity provided by environments. Its theoretical foundation is “cognitive map”, which is embedded with assumptions of Gestalt organization or pattern-based interpretation of environments. The pattern is extracted and retained in spatial representation due to its significant probability of maximizing functioning. From Canter’s perspective, preference implies purposive evaluation; high satisfaction suggests that personal goals or expectation are supported by physical as well as social environments. It is a functionalist perspective to environmental satisfaction and also cognition-dominating approach that emphasize cognitive systems in interpreting socially-agreed reality.

2. Knowledge

Knowledge of a place is the result of interactions between subjective and shared understanding of a place. It contains information of what a place is (meaning) and how to get there (rules). Personal interpretation is an internal process of understanding the world. To Lynch and Kaplan, it is a mental image, a representation of a place. To Appleyard, the representation is involved with meaning assignment because only a significant place is anchored in one’s cognitive map. From Golledge’s (1991)

perspective, meaning of a place entails its inherited rules or procedures of actions in that place.

Environmental knowledge to him is a dynamic process in which existing meaning of a place is constantly modified or updated by results of actions.

Canter emphasized intersubjective aspects of environmental knowledge; human's cognitive systems restores and retrieves shared understand of environments, which "captures mixture of percepts, customs and habits associated with place use" (Canter, 1991, p. 197). It is the understanding of social logic of space or what Weisman called, "program". People behave according to the knowledge, and evaluate satisfaction based on its support of personal goals.

3. Action

In this model, people are viewed as agent; they have ability of control and making choices. (Averill, 1973). Their action is purposive and embedded with practical rationale. The action contains probabilistic estimation of how and what make things work. A stable and high probability relies on understanding of programs or place rules.

Altman argued that action is not just a product of stimulus but a system composed by people and environments with evaluative relationship or feedback loops between desired and achieved experience (or consequences of action). From Canter's (1991) perspective, the feedback is also involved with evaluation between individual actions and place rules. People behave accordingly to achieve personal objectives. Place rules are not always written or orally expressed. From Canter's perspective, observable behavior also serves as cues conveying do's and don'ts in a particular setting. For example, observation of some people being neglected in gardens for several hours may reshape one's evaluation of the space and change his or her behavior of outdoor visits. Seeing family events constantly held in outdoor settings reminds residents of a social space they can use.

It is hard to divide the boundary between preference, knowledge and action. As one may find, there are some overlapping qualities among them. Nevertheless, it is important to recognize their

distinct characteristics and pay attention to interactions between each other in shaping particular place experience.

4. Experiential Attributes: Theoretical underpinning and evidence from research on interior settings

The central argument of this model is that place experience is convergence of results of interactions between 1) preference and action, 2) preference and knowledge and 3) knowledge and action; each of the interactions is associated with the nine experiential attributes of institutional outdoor environments that are concluded in Chapter 2. They are 1) privacy, 2) social interactions, 3) accessible space and built features, 4) sensory stimulation, 5) safety and security, 6) familiarity, 7) information awareness and spatial orientation, 8) sense of ownership, and 9) participation in meaningful activity.

Understanding each attribute and its theoretical underpinning may help further theoretical construction or development of quality measure of institutional outdoor environments. Evidence of supporting the theoretical statement is extended to include information provided by research on interior environments of long-term care and health care settings because of its research diversity and depth. It complements knowledge of nursing homes settings generated from the reviewed articles in Chapter 2.

1) Preference and Action

Theoretically, interactions of preference and action indicate that actions are taken for 1) maximizing functioning or survival 2) achieving personal goals. The first aspect is related to control environments to maintain optimal environmental stimulation or cognitive clarity for quick adaptation. Territorial behavior (e.g., Altman, 1975) may belong to this category; human controls access of information, stimulation or interaction between self and external environments to ensure survival in terms of physical and psychological safety or positive affect status. The second one is related to

strategies people applied to making things work. The strategies are assimilated or corresponding to social logic of space or patterns with “similar essences, attributes, or abstractions in ways that solve problems and serve interests” (James, 1983 cited in Seigfried, 1990, p. 101) so personal objectives can be achieved in a high probability. For example, people use socially-accepted tactics like controlling personal space to maintain their preferred level of privacy (Altman, 1975; Canter, 1991).

The two aspects are experiential in nature and can be associated with experiential attributes of institutional outdoor environments including 1) sensory stimulation from natural environments, 2) safe and secure environments, 3) accessible space and built features, 4) privacy and 5) social interactions.

- ***Sensory stimulation:***

Experience of sensory stimulation in context of nursing homes suggests people try to achieve desired quality or strength of stimulation so positive affect or to cognitive clarity (avoid exhausting directed attention) can be maintained. Studies have shown that people with dementia are vulnerable to environmental stress from sensory deprivation or overload (e.g., Cohen-Mansfield, 2000; Kovach & Schlidt, 2001). Consequences of imbalance stimulus may include agitated behavior (Kovach & Schlidt, 2001) and learned helplessness (Seligman, 1975), in which residents are unable to prevent noise, smell, lighting and heat or cold from becoming uncontrollable. Nursing home environments are commonly found to be either very stimulating with a noisy crowd or monotonous with inadequate social and sensory stimulation (Cohen-Mansfield et al., 1992; Cohen-Mansfield & Werner, 1998a; Kovach & Henschel, 1996; Lawton, 1981). Different strategies have been studied to optimize exposure to stimulation; among them was environmental modification viewed as effective intervention (Kovach & Schlidt, 2001). However, the issue of how much stimulation is appropriate is never answered. Given the fact that each individual has a different optimal level (Wohlwill, 1966), the answer may lie in solutions of how to facilitate regulation of sensory stimulation.

For example, controllable indoor dimer switches may allow residents to individualize a lighting level (Bakker, 2003). Light controls by the bed, and window shades also help regulate stimulation (Van Haitsma et al., 2004). An accessible and visible temperature control panel allows residents to adjust heat and cold (Calkins, 2001). Besides, outdoor views from hallways, households or communal areas provide nearby soothing visual experience (Van Haitsma et al., 2004), and allow residents to regulate their sensory levels from the inside (Mason, 2011; Yao & Algase, 2006).

In institutional outdoor environments, sensory regulation is facilitated by providing choices of seats with various distance from mainstreams (Ulrich, 1992) and in shade and sun (Carpman et al., 1986; Cohen-Mansfield, 2007; Cranz & Young, 2005), which allow residents to find a place to sit with appropriate stimulation in terms of voice volume and body comfort. Flower raised beds with different heights expedite interactions with natural materials (e.g., picking up vegetables) for people with physical limitation (Zeisel & Tyson, 1999). Some scholars encourage nursing homes to have “food gardens” so residents have opportunities to experience five-sensory stimulation from familiar activities such as watering plants, tearing and tasting garden-grown vegetables (Bengtsson & Carlsson, 2005; Dunnett & Qasim, 2000).

In addition to environmental intervention, some actions taken by organizations or staff may help enhance the effects. For example, staff can develop resident profile of garden preference and provide preferred and familiar resource for sensory stimulation. Organizations can support staff to receive training or education in utilizing outdoor resource to create quality sensory stimulation.

- ***Safety and security:***

Senses of safety and security in context of nursing homes describe actions related to control over an area in need of freedom from danger and risk. In a hospital setting, scholars found patients have a strong attempt of maintaining safe environments. They ask staff to check and fix broken furniture, and they make sure problems are taken care of. When they found they have little control over staff actions,

they feel insecure (Williams et al., 2008). Empirical research on nursing home environments has suggested that certain physical features may facilitate resident control on safety and security. For example, a visible nursing station allows residents to seek helps easily (Morgan & Stewart, 1998). A nearby call button that can be reached from the bed increases real and perceived safety (Van Haitsma et al., 2004). Monitors, alarms or other types of communication device allow residents to communicate with staff immediately when they need help (Van Haitsma et al., 2004).

Very few studies address safe and secure outdoor environments. Some design recommendations have suggested that an emergency communication device (Marcus, 2007a) would enhance residents' active role in asking help. Different choices of shade seats (Cranz & Young, 2005; Marcus, 2007b) allow adjustment of microclimate based on individual preference. Scholars also recommend that a garden should have visual access from nurse stations and corridors for immediate but unobtrusive supervision (Alden, 2010; Benjamin et al., 2009; Lovering et al., 2002; Marcus, 1999) .

Staff and organizations are also play important roles in maintaining safety. For example, staff attitude in terms of encouraging residents to talk about their worries of environments, and helping them solve the problems may build up their sense of safety and security. Staff can also make themselves visible and available in outdoor environments to respond to immediate requests. Organizational policy related to surveillance and outdoor maintenance is also critical. For instance, staff should be asked to check on outdoor residents regularly and to supply adequate water, hats or clothes for basic needs. Besides, staff should be asked to remove toxic plants and hazardous materials like pesticides away from gardens.

- ***Accessible space and built features:***

Accessibility suggests that residents are able to control relationships with others and control over how, when, what, and where to receive influence, support and assistance from others to achieve their goals or perform activities. Inaccessible environments have been associated with “learned

helplessness” (Seligman, 1975), which describes that people’s passivity is learned through interaction with environments where they have no control over surroundings and no choice of activities . In nursing home settings, resident’s learned helplessness is often related to a lack of opportunity of decision-making (Harper Ice, 2002(Harper Ice, 2002) and encouragement of dependency from organization, staff and physical settings (Abramson et al., 1980; Avorn & Langer, 1982; Baltes et al., 1983; Thomas, 1996). Inners et al., (2011) found in some nursing homes, residents are required to ask for permission before using a communal space. Coyne & Hoskins (1997) observed that staff’s expectation, acceptance and encouragement of ADL (Activities of Daily Living) passivity leads to resident dependency. Also, Evan & Stecker (2004) found that over exposure of sensory stimulation with no control over it has contributed to learned helplessness.

Accessible environments may help maximize autonomy and independence. Grab bars in a bathroom allow residents to get support and reduce possibility of falling (Trotto, 2001). Providing choices of shower or tub bath could encourage self-determination (Kovach & Meyer-Arnold, 1996). A closet that is organized to cue what clothes to be worn increases dressing independence (Gitlin et al., 2003; Namazi & Johnson, 1992). Wheelchair accessible bathroom (e.g., flexible placement of grab bars, height-adjustable toilet seat) fosters independence in toileting and grooming (Van Haitsma et al., 2004).

Design recommendations of accessible nursing home gardens include a short distance between resident rooms to gardens (Cutler & Kane, 2005), wheelchair accessible physical features (e.g., automatic doors, flat threshold of entry door), a level garden pathway that allows two wheelchairs to pass (Grant & Wineman, 2007), and entry points that avoids behavior conflicts between in-and-out activities (Marquardt & Schmieg, 2009).

In addition, accessible environments can also be created by staff members. It is important to encourage residents to learn to do thing on their own and to engage in activities that they are familiar with and still be capable of (Cohen & Weisman, 1991). Staff can provide different choices of activities

(one-on-one or group activities) based on resident functioning levels, and encourage residents to make decisions of activity participation (Marcus & Sachs, 2013). However, diverse and individualized outdoor activities require adequate activity staff or volunteers; it is necessary to have organizational support in that aspect.

- ***Privacy:***

Privacy is involved with control of information access between self and others (Altman, 1975). The action is taken based on culture, norms and socially-agreed values to achieve desired privacy (Canter, 1991). A match between desired and achieved privacy levels is constantly achieved suggest that residents are able to control stimulation and also regulate relationships between self and others dynamically, that is, people can control how close and intimate they feels toward another person or group in any setting and moment.

A lack of privacy has been reported in nursing home settings; some scholars reported that residents feel less privacy in shared room than in private rooms (Day et al., 2000; Morgan & Stewart, 1998; Van Haitsma et al., 2004). Although there are curtains to help maintain privacy, it reduces only visual invasion (Calkins, 2001; Van Haitsma et al., 2004). A nursing home courtyard that is visible from everywhere creates a fish-bowl effects —a feeling of over-exposure (Pasha & Shepley, 2013; Sadler, 2007). Although high visibility of outdoor space can maximize safety and security, resident's need for privacy is compromised. Some scholars suggested that provision of seats partially enclosed by plants or lattice may mitigate the issue (Bengtsson & Carlsson, 2005; Carpman et al., 1986). Providing choices of seating spaces located in different distance from entrances or a main stream may help residents achieve a desired privacy level; seats away from a major path prevent being observed or private conversation from being overheard (Cranz & Yang, 2005). Providing movable furniture that allows residents and their family members to adjust seating orientation or distance also provides a similar function (McBride, 1999).

It is essential that staff and organizational environments are responding to resident's choices of privacy level. For example, staff members could make supervision less an issue in their courtyard (Cohen & Weisman, 1991). They can ask resident preference of public or private seats before wheelchairs them to gardens. Staff can help residents to set up their privacy settings by rearranging furniture, planters or seat orientation. Organizational support in staff training or education is also critical. Staff shall be aware of resident needs and able to utilize resource in outdoor environments (e.g., lattices, plants or shade device) to create a safe and private setting.

- ***Social interactions:***

Social interactions are related to experience of maintaining quality socialization in terms of control of initiation/termination of social contact (Essex et al., 1965). The control mechanism to start, continue and stop conversations is based on consensual understanding of how a specific setting or event is planned in its architectural and activity programs.

Spontaneous and formal social interactions help build up social relationships and provide cognitive stimulation (Cohen & Weisman, 1991); however, the benefit is not well optimized among nursing home residents who suffer from sensory and communication impairments as they are the group with high risks of social isolation (Cohen-Mansfield & Werner, 1997; Resnick et al., 1997). Some environmental interventions are applied to increasing social interaction. Their underlying assumption is that furniture and other built features can well serve as environmental cues of socialization. Research has shown that provision of social spaces with different levels of privacy (e.g., two-person seats, chair and table sets in enclosed guest rooms and public seats in commons) contributes to formation of different types of social activities (Calkins, 2009). A connecting door between private rooms helps initiate conversation by just knocking the door (Van Haitsma et al., 2004). Some scholars suggest that movable furniture help improve quality of social interaction. Residents and their family members can adjust seating angles or distance in response to their need (Geboy, 2005). A lack of chairs in bedrooms

has found to reduce social opportunities because no space is offered for people to stop and talk (Van Haitsma et al., 2004). In outdoor environments, movable furniture (Steinzor, 1950) and orientation of seats have been associated with amount of social behavior (Barnhart et al., 1998). Marcus (Marcus & Barnes, 1995) suggests that provision of different choices of seats in shade, in sun and with different levels of privacy may sustain longer social interactions.

Staff and organizations are as important as environments. In terms of formal social events, they determine how event information is delivered, conducted and set up. Their attitude and behavior also work as cue guiding resident's social contact. Gutheil (1991) found that staff members in some nursing homes like to determine seating arrangement for residents in social events, which creates difficulty in developing new friendships between residents (Gutheil, 1991). Rosen, et al (2008) revealed that staff members establish routine for cognitively impaired residents by placing them in the same seat everyday but at the same time, keep reminding them that the chair is public and must be shared. This conflict attitude creates confusion and is associated with social deprivation and aggression. In an organizational level, policy of outdoor use may become an obstacle of socialization. For example, a familiar pattern of socialization such as having lunch with friends at gardens is often disallowed due to maintenance and staffing issues — with extra work loads of setting up and cleaning outdoor lunch environments. As a result, residents who used to have that at home may be forced to adapt a new way to get social support or just lose motivation of socialization.

2) Preference and Knowledge

Interactions of preference and knowledge imply two levels of theoretical discussions. First, it suggests pattern-based environmental knowledge in terms of declarative and procedure knowledge aids quick adaptation and appropriate functioning (Canter, 1991). Second, it describes roles of place rules in shaping place satisfaction or environmental evaluation. Rowles's idea of insideness (Rowles, 1984, p. 146) comprises the two concepts, helping understanding the essence of this experience. The insideness

of a place has three components. First, it is characterized by physical insideness, denoting experience “of being almost psychologically melded into the environment...an intimacy with its physical configuration stemming from the rhythm and routine of using the space over many years”. The physical insideness in Weisman’s framework suggests familiarity with a place’s physical programming. The familiarity reflect deep understanding of physical configuration in enhancing patterns of daily activity (daily functioning or functional programs); people know immediately what will happen, where to go and how to get there to achieve personal goals.

Second, it is related to social insideness, which is referred to as experience “that evolves not only from everyday social exchanges and relationships but also from a sense of being known well and knowing others.” (pp. 146-147) Social insideness connotes understanding of a place’s activity programs; it is knowledge about local interactions of different social roles, which is rooted in individuals and local culture. People behave and interpret the interactions based on the knowledge to create a well-functioning community or society as a whole. Finally, it has a components of “fantasy”, or “social imageability” (Shumaker, 1987), which describes experience that people vividly evoke one’s personal history in a specific place. It is a process of life retrospect or evaluation of how one’s life experience (e.g., being a mother, wife or somebody’s close friend) is programmed and grounded in social relations and physical space.

These concepts correspond to two experiential attributes of intuitional outdoor environments include familiarity as well as information awareness and spatial orientation.

- ***Familiarity***

Familiarity in one aspect is referred to as experience that people can accurately and quickly retrieve environmental knowledge (Kaplan & Kaplan, 1982). In another aspect, it suggests people are rule-savvy (hidden or formal programs); they know how to achieve personal objectives related to their

social roles and they evaluate self-value and environments by seeing how their goals are supported. Simply speaking, familiarity is a feeling of “being at home”, an experience of “making sense”.

Familiarity is an important theme in practice of occupational therapy for home modification (Tanner et al., 2008) and in healthcare concerning routine-establishment for older adults in institutional settings (Zisberg et al., 2007). One strategy of increasing familiarity in nursing homes includes provision of familiar settings that enhance past social roles (Kunstler & Daly, 2010). Studies have found that participants in a familiar activity and space show positive emotional status (Beyersdorfer & Birkenhauer, 1990) (Lindenmuth & Moose, 1990; McArthur, 1988).

Physical settings that link to the past and promote self-continuity may foster senses of familiarity. For instance, a familiar layout in which dining areas are placed in the same floor of residential units (Negley & Manley, 1990), familiar furniture and personal items in one’s bedroom (Calkins, 2001; Williams, 2002) and significant decoration in one’s household (Van Hartsma, et al., 2004) are effective architectural strategies. Scholars have found that space for displaying personal items, pictures or meaningful memorabilia is associated with more positive affective and behavior (Calkins, 2001; Day et al., 2000; Namazi et al., 1991; Zeisel et al., 1994).

Besides, garden plants that are selected with which residents are familiar are associated with satisfaction and pleasantness of outdoor environments (Chapman et al., 2007). Zeisel & Tyson (1999) argued that routine-like activities (activities that are held regularly at homes) bring up familiarity in nursing home gardens. Feeding birds, watering plants, reading a book, and setting a picnic table are some examples that continue past leisure experience and enhance past social roles and role value of being a mother, gardener, and wife.

Having familiar outdoor environments may require staff to be acquainted with residents’ life history and leisure preference, and to deliver activities that link to the past life experience. It may also require organizations to provide policy allowing continuity of playing past social roles in physical settings

and in activities. Prohibiting outdoor lunch or bird feeding may contradict resident past knowledge about gardens.

- ***Information awareness and spatial orientation***

Information awareness and spatial orientation describes experiences related to formation or utilization of pattern-based knowledge in evaluating environment's support of personal goals. The pattern is workable and socially-significant in the sense that helps optimize functioning. Living reality comprises dynamic and complex interactions between people and environments. People (older adults with dementia in particular) are struggling for seeking constancy— a pattern that has a set of variables to keep accurate estimation and to solve everyday problems.

Effective organization of people, activity and physical environments relies on continuity (Kaplan & Kaplan, 1982), a form of association between different representations or snapshots of environments. Traditional nursing homes are notorious for developing pattern-based knowledge. A typical layout usually consists of double-loaded corridors with rooms on each side, and nursing stations at the center connecting corridors for easy surveillance (Chapin, 2008). A big dining space at the end of each corridor is also another feature. The layout creates no meaningful connection between activity spaces. It is very challenging for older residents to navigate from the dining room to their household without assistance. Meaningful connections here suggest continuity of the past.

Environmental interventions for this issue are to create a familiar and simple layout. It helps signify space and orient directions. For example, a kitchen space can be placed next to gardens; a sun room located between living room and garden space creates a home-like environment; meaningful activity alcoves can be created along walking paths (Cohen & Weisman, 1991).

Meaningful objects are also helpful. Family pictures and personal items help identification of one's room and suggest occurrence of private activities (Cohen & Weisman, 1991; Marquardt, 2011; Nolan et al., 2002). Comfortable furniture and carpets may help identify social space and encourage

appropriate behavior. Residents' artworks can also serve as cues to indicate an activity room (McClannahan & Risley, 1974). In a design example of adult day care proposed by Weisman and his colleagues (Moore et al., 2001), smell of coffee and pancakes serve as successful cues conveying information of activities (action of cooking, drinking, eating and reading newspaper) and location.

Tyson (Zeisel & Tyson, 1999) applied Kevin Lynch's five elements in *Image of the City* (1960) to garden design for residents with dementia; elements include paths, edges, districts, nodes and landmarks. Her purpose is to facilitate formation of patterns of use. Some of her strategies include using a gazebo as a landmark and as nodes of social activity. She also place benches along paths to enhance edges that guides walking to a destination. Zeisel & Tyson (1999) recommend that different paving patterns can use to define hierarchy of activity space and guide appropriate behavior.

To maximize awareness and orientation, organizational policy, staff and physical design have to work together. Outdoor policy and activity information have to be clearly conveyed to residents, so they know there is rhythm and routine of activities. The rhythm can be created in a familiar way. For instance, in garden space, planting flowers in springs and harvesting vegetables in falls may help connection and promote memories of past life experiences.

3) Action and Knowledge

Interactions of action and knowledge suggest that actions are taken to create desired patterns based on environmental knowledge. Following the premises of pragmatism, human is assumed to know and able to develop "summary generalization" (Polkinghorne, 1992; Davison, 2003). "Summary generalization" is workable patterns that are significant for individual or societal functioning. One way to achieve desired patterns is through controlling or predicting information in a specific setting based on place rules (what most of people thinks is appropriate and workable).

For example, students who read a book in a library need not only a specific book in the institution but also public transportation from home to a school library, student ID, wireless service etc.

They have to make reservation so the book is not checked out from somebody, take bus on time, and check online information to retrieve the book etc. This array or sequence of different factors is a workable pattern that is managed to successfully get what people want based on their understanding of resources. It is process of personalizing and signifying organization of rhythm in daily practice. Two attributes of institutional outdoor environments capture the nature of this experience: sense of ownership and meaningful activities.

- ***Sense of ownership***

Sense of ownership describes experiences of taking actions on environments in conveying that a place is owned by someone. An owned place indicates that owners determine place rules to achieve their goals. One simple action to declare that “I own this place” is to put “personal markers” in environments (Altman, 1975, p. 131). No matter the form of the marker, it expresses what is allowed in a specific place. A useful cue lies in consensual interpretation (Canter, 1991) and is related to different local programs (Weisman, 2001). For example, the fact that fence can prevent trespass is related to 1) owner’s higher demands of privacy and safety, 2) fence that is placed based on local landscaping ordinances, and 3) local land trespass laws that guiding behavior.

In nursing home settings, experiences of ownership are related to a process of personalizing space. It indicates the extent of one’s autonomy and control over environments (Cohen & Weisman, 1991). A lack of sense of ownership has been associated with more anxiety and aggression (Zeisel et al., 2003). Several architectural interventions are found to support ownership cultivation. For example, wheelchair accessible shelves, bulletin board and small dressers that allow displaying and collecting personal items help personalize bedrooms (Van Haitsma et al., 2004; Zeisel et al., 1994). Having plants in one’s bedroom also provides similar experience (Van Haitsma et al., 2004). In outdoor settings, personal objects such as bird feeds (Alden, 2010) and plants tied with resident names (Collins & O’Callaghan, 2008) are associated with experience of ownership.

Sense of ownership is also related to whether residents are encouraged to take responsibility for their own lives (Cohen & Weisman, 1991). Staff can program activities such as decorating rooms or helping furniture arrangement (Cohen & Weisman, 1991; Van Haitsma et al., 2004; Calkins, 2001), in which staff is a cultivator or facilitator encouraging residents to make their own decision. In an organizational level, outdoor policy that allows residents to bring personal items (e.g., bird feeders) from homes or to make decision about plant materials and furniture would also help.

▪ ***Participation in meaningful activities***

Meaningful activities are referred to as activities that increase senses of personal value—feeling useful (Kaufman, 1993; Kiyota, 2009; Thomas, 1996). The usefulness suggests that one can solve individual or group problems by using his or her existing knowledge. The knowledge comprises several workable patterns for achieving personal goals related to one's past social role. "Meaningful activity" is thus practical with emphases on identity, lifetime interests or responsibility.

Loss of identity is commonly found in relocation to institutional settings (Kane et al., 2003; Nay, 1995; Paterniti, 2003). Participation in meaningful activities may help mitigate the impact by increasing sense of self-identity and belonging (Cohen & Weisman, 1991; Eakman et al., 2010; Vernooij-Dassen, 2007). Studies have shown a positive relationship between resident well-being and participation in life tasks given with personal meanings (Ryff & Singer, 1998; Sanderson & Cantor, 1999).

Activities such as cooking, baking, gardening and art-related activities are found to help increase personal value among women in nursing homes (Rae, 1990). Studies found that women feel they lose personal identity when disability limits shopping and cooking (Gustafsson et al., 2003; Hockey & James, 1993; Pound et al., 1998). For example, Gustafsson et al (2003) found women define themselves by how capable they shop in stores, prepare dishes from ingredients and serve meals; their pleasure and a life order is created by food-related work. Gustafsson pointed out that women who can cook are often

proud of themselves by making meals from scratch. After suffering from stroke, they buy ready-cooked meals because they struggle with all tools and with giving their lives meaning and significance.

Another type of a meaningful activity is caring for others. Thomas (1996) argues that tradition nursing homes often neglect human needs of caring for others. Caring for other enhances human values and brings satisfaction to human being (Whitlatch et al., 2005). Activities such as helping house chores, fixing things, providing advices, and volunteering have been recommended to increase opportunities of caring for others (Carlson et al., 1995; Kasper et al., 1994; Sutor et al., 2001). Kiyota (2009) argue that nursing home residents are not only care receivers but caregivers. Her study showed that residents have desires to take care of environments, and residents felt sense of personal vale, control and self-esteem after caring for plants. Francis (1992) holds the same position; he explained that gardening enhances personal value because people are able to get positive feedback from environments; gardeners harvest practically and also experientially—with a process that you gain something, but also give something from yourself to the environment.

Conducting a gardening program in nursing homes is not an easy task. It required supports of organization, staff and physical environments. As mentioned by Kiyota (2009), it is important that staff is encouraged to make the program more interesting and productive without worrying about adding extra work. Other factors include adequate resource for staff (e.g., budget and training) to enhance results of resident's hard garden work. Besides, organizational commitment to accessible gardening environments is also critical (Söderback et al., 2004). Some environmental features make gardening less demanding for older adults and people with disability such as universal garden tools, a lightweight watering can and wheelchair-accessible flower beds (Davis, 1998).

4) Summary

Discussions of the nine attributes are framed by pragmatic understanding of action, preference and knowledge. As mentioned in the above sections, the three processes have some overlapping

qualities and therefore, each of the attribute to some extent is involved with the triad at the same time. However, the involvement varies. After tracing back to their theoretical origins, most of the attributes are strongly linked to interactions between action and preference.

Each attribute suggests a particular arrangement of physical environments, people and place rules. Some desired arrangements have been suggested by research on better practice or resident quality of life. They may serve as guidance in understanding or evaluating institutional outdoor environments. The convergence of the nine attributes is place experience. It reflects personalities of a place and the answer of “How a place feels like” (Moore et al., 2001). The combination of the nine attributes helps distinguish place from place. Identifying the “experiential compound” and revealing its pragmatic usefulness is one of major goals of this study.

CHAPTER 4 : METHODOLOGY

I. Research Questions

Chapter 2 reviewed the existing research on outdoor environments of long-term care and health care settings and suggested a need for complementing the current understanding mainly shaped by the interactive worldview or stimulating-based approach. In Chapter 3, a model of experiential outdoor environments of nursing homes was proposed. Following the premises of pragmatism, the model seeks for a middle ground solution to moderate tension between positivism and interpretivism. The model is developed based on systemic place theories (Canter, 1991; Weisman, 2001). It conceptualizes the outdoor environments as a system that consists of three major sub-systems (physical settings, people and rules) and interactions between them; place experience is the result of the cross-sub-system interactions. Following the conceptual framework, this chapter presents the methodology for investigating outdoor environments of multiple nursing homes by answering the following research questions:

1. What is place experience of outdoor environments of nursing homes?
 - a) How are the outdoor environments defined experientially?
 - b) What are the characteristics of the contexts—physical settings, people components and rules of place use— potentially shaping place experience within each nursing home?
2. What are the shared experiential features of outdoor environments?
3. Which outdoor environment is more outstanding in terms of experiential qualities?
 - a) What contexts are advancing the desired qualities?

The first question is to reveal experiential attributes of outdoor environments and describe objective, subjective and consensual qualities of place experience. Comparison of place experience between cases helps identify socially-shared nature of outdoor environments. Understanding the nature may aid in categorization of outdoor environments in different place types. For example, a nursing home and hospital courtyard are both described as institutional outdoor environments but they may be different in terms of physical, social and experiential contexts. Building typology may help communication and theory-building (Moos, 1976). The third question is to select a relatively effective place that has more desired experiential qualities. Its arrangement of contexts may guide a less than optimally functioning case for future improvement.

II. Research Design: Pragmatic Case Study

This study applied a case study method because it retains “the holistic and meaningful characteristics of real-life events” (Yin, 1994, p. 4) and maintains high ecological validity. The features cater to this study, which attempts to reveal situations that occurs naturally in natural or conventional settings (Plowright, 2011). The research design took pragmatic usefulness into account. It is guided by Fishman’s pragmatic case study rather than Yin’s positivist case study.

Yin’s positivist case study

Yin (1994) defined a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.” From Yin’s perspective, the empirical inquiry, like an experiment, can be used for theory or hypothesis testing, and theoretical propositions should guide development of research objectives, design and analysis. Although a case study can be descriptive, Yin argued that the descriptive purpose is to “identify an embedded unit of analysis and an overall pattern of complexity that ultimately was used in a causal sense to explain why implementation had failed” (Yin, 2003, pp. 114-115).

Yin's pattern-matching strategy and testing rival explanations for data analysis follow such "testing" concept seeking and consolidating universal rules. Generalizability is decided by the extent of findings generalizing to theory rather than to population (Yin, 1994). This type of generalization is called "analytic generalization", a process related to how findings are linked with a particular theory and how the theory applied to other settings "that may be dissimilar but that can be illuminated by the theory in question, appropriately modified." (Becker, 1990 cited in ; Tashakkori & Teddlie, 2003, p. 256)

Groat and Wang (2002) deleted the word "contemporary" in Yin's definition and adding the word "setting" to describe a case-study approach for architecture research. They concluded five primary characteristics of a case study: 1) a single or multiple cases studied in real life settings, 2) explanation of casual links, 3) theory building and development, 4) multiple resources of evidence allowing for data triangulation and 5) the power to generalize to theory. The five points are not beyond Yin's discussion and do not show Groat and Wang's attempt of reducing the positivist feature for architecture research.

Case studies have been widely applied in landscape architecture research and practice. Francis (2001) provided the following definition for research in landscape architecture:

"A case study is a well-documented and systematic examination of the process, decision-making and outcomes of a project, which is undertaken for the purpose of informing future practice, policy, theory and /or education." (p. 16)

To Francis, cases studies can be used to describe, explain and predict theories; they are also feasible to serve as a "strategic approach or rule of thumb" of practice (p. 18). Through revealing exceptional work or more typical projects, practitioners learn problem-solving knowledge and skill that may achieve effectiveness in a high probability. However, Francis perceives case studies for research and practice as two different fields; little discussion was provided to address what guides practitioners to conduct and evaluate case studies or whether theory-oriented case studies would generate instrumental meanings to practice.

Fishman's pragmatic case study

Fishman's pragmatic case study shares some features with Yin's approach but is different in several ways (Fishman, 1999). First, a pragmatic case study begins with particular problems presented by clients (an individual, group, organization or community) rather than testing hypotheses derived from theoretical propositions. Second, integration of theories with practice is emphasized. Fishman conceptualized a case study as a process consisting of feedback-loop relationships between theories (or research findings), practice (or any action taking) and evaluation (Figure 3-2). Theories or scientific research findings act as guiding concepts to guide design or evaluate a program; evaluations of the program reformulate practice and shape theories or expand personal experience. Third, a pragmatic case study is multiple-case oriented. Fishman explained, " ...when a single case is studied as such because it is an instance of a rare or unique program, more typical is the study of multiple cases that form a continuum of exemplary, average, or poor programs vis-à-vis achieving a particular set of goals. Even through an individual researcher might study only a single case, that study is frequently part of a multiple-case design in that the single case is intended to be compared and contrasted with other cases dealing with similar initial conditions, problems and goals." (p. 169)

Fourth, a pragmatic case study is interested in how a project or program functions as a whole system; knowledge of phenomena is thus systemic and revealed in patterns of variables or indicators. The patterns are then compared with an ideal one that reflects "best practice" rather than a theoretically predicted pattern preferred in Yin's study. Through comparison, outstanding projects or models are identified. Fifth, generalizability depends on "transferability" (Lincoln & Guba, 1985). Readers decide the extent of generalizability based on detailed descriptions of contexts provided by research authors. When more and more successful case reports are accumulated and different types of contexts are studied, shared features among successful models may suggest high applicability of findings to other sites.

Pragmatic case study approach is particularly suited to this inquiry for the following reasons. First, this inquiry starts with the concern of low effectiveness of outdoor environments of nursing homes. Its ultimate goal is to help trigger change. Second, the study is to respond to a demand of theoretical and paradigmatic pluralism. It is expected to offer a means of moving outside a conventional thinking box of research. Based on those reasons, this study requests an approach that can accommodate these two aspects or an approach that echoes Groat and Wang's (2002) attempt to bring architectural research into design processes and vice versa.

A. Case selection

1. Pilot study

A pilot study was applied to understanding application of case-study methodology in terms of feasibility, time and cost. It consists of five steps from selecting pilot cases to creating reflections in research design.

Stage 1: Selecting pilot cases

Cases were filtered using an online search system provided by Center for Medicare and Medicaid Service (U.S. Department of Health and Human Services, 2015). Filtering criteria first took into account geographic location. The system generates a list of 114 licensed Wisconsin nursing homes located within 100 miles from downtown Milwaukee. By examining satellite images from Google Earth, the list was narrowed down to 40 nursing homes whose images showed an intended outdoor space adjacent to or enclosed by facility buildings. Access was granted by 16 nursing homes but three of them were unable to set up a visit day for several reasons (e.g., change of the administrator). Thirteen nursing homes with 14 outdoor environments were on the final list. A variety of outdoor settings were included in the list: courtyards, landscaped patios, parks, roof gardens, and entry gardens.

Stage 2: Visiting the 14 cases and developing an assessment tool

Six months were spent visiting the 14 cases. The process started with communicating research objectives to administrators followed by one-site data collections. Data collection strategies include collection of background/archival information, one-day behavior observation, field notes, evaluation of physical settings, and interviews with activity staff and their director or administrator.

An assessment tool was developed to evaluate physical settings of the 14 outdoor environments. The reason for creating a tool is that current environmental assessments for older adults (e.g., Professional Environmental Assessment Protocol (PEAP) (Weisman, et al., 1993) and Multiphasic Environmental Assessment Procedure (MEAP) (Moos & Lemke, 1994)) address few aspects of institutional outdoor environments. Although Marcus (2007b) developed a garden audit tool specific to institutional outdoor settings for people with dementia, it requires some modification to meet the needs of this study. For example, in spite of a major focus on physical settings, some items measure experience and others check the functions of a particular feature; the mixture suggests a need of theoretical clarification in terms of relationships between subjective and objective measures. Furthermore, evaluation items are not organized in a way that helps understand spatial, sensory and built properties of physical settings. They do not explain in detail their theoretical, empirical or practical purposes. For example, one item describes an ideal ratio of green to hard surfaces as 70 to 30; however, it is less than convincing due to a lack of support from research findings or design recommendation.

The assessment tool created for this study is based on previous studies and design recommendations reviewed in Chapter 2 (Appendix A); their description of ideal physical settings served as the foundation to develop 48 evaluation items. The items were divided into spatial, sensory and built groups. Evaluation was conducted by the researcher on a 5-point Likert scale (Appendix D).

Stage 3: Analyzing and documenting the cases

Spatial properties, sensory properties and built features of each case were documented based on analysis of floor plans, photo documentation and field notes. Residents' experience and staff's attitude toward the outdoor space were described. The reports were summarized in a paper and presented at conference (Shih, 2013). In terms of evaluation of physical settings, the 14 outdoor settings generated a mean score of 123.71 (SD=28.56) with a range from 79 to 191. Based on their scores, the 14 cases were divided into four percentile groups: scores lower than 25th percentiles (four cases), between 25th to 50th percentiles (three cases), between 50th to 75th percentiles (three cases), and greater than 75th percentiles (four cases). The four groups serve as case pools and form a continuum of cases with different quality of physical settings.

Stage 4: Reflections in research design

Results of the pilot studies provided several theoretical and method implications. First, the 14 cases studies confirmed the construct of the theoretical concepts provided in Chapter 3; each outdoor environment is characterized by interactions between three components: physical settings, different social roles and their perception of what an outdoor space ought to be. Second, administrators and staff in general showed a positive attitude toward the inquiry; they were flexible in a way that put no restriction of time and methods of data collection. Staff were less defensive and willing to reveal challenges they encountered when using outdoor space and carrying outdoor activity programs. Third, to facilitate interviews with residents, different strategies and technique were tested. In general, a resident interview was better to be finished within 30 to 40 minutes before residents get exhausted. Visual aids were a useful tactic to keep residents focused. Interviewees who suffer from some cognitive impairment required more than one interview section to answer all questions. Therefore, an extensible research plan was important to accommodate unexpected changes. Fourth, there is a necessity to develop evaluation tools to assess organizations and staff. Data may complement descriptive analysis of

organizational and staff environments. These tools have to be developed or modified into a form suitable for answering research questions and solve issues in Marcus's garden audit tool.

2. Case selection: Three courtyards

Following the premises of a pragmatic case study, three cases characterized by high, medium and low quality of physical settings were selected from the 14 outdoor environments. The first case was selected from the case groups whose evaluation scores were greater than 75th percentile; the case had equally higher scores in spatial, sensory and built properties and its administrator granted access to the facility. A similar process and criteria were applied to select the other two cases. The second case ranked at the 50th percentile and had equally medium scores in the three properties. The final case was selected from the less-than-25th-percentile case group; it scored at the bottom in the three properties respectively.

Based on the proposed model of experiential outdoor environments of nursing homes (see Chapter 3), different levels of quality of physical settings suggest different dynamics in the three sub-systems. Each case thus has distinctive place experience that is worth studying.

The three outdoor environments are all in a form of enclosed courtyard space, each of which is located in a certificated and licensed nursing home. All the three courtyards were furnished and accommodated spontaneous and programmed activities.

III. Facility Background of the Three Courtyards

A simple facility background of the three cases is summarized in Table 4-1. They were varied in location, open year, number of beds and neighborhood economic levels.

Table 4-1. Comparison of facility background of three cases

	Silver Life	Golden Age	Elderly Living
Location	15 miles west from downtown Milwaukee	12 miles north from downtown Milwaukee	12 miles south from downtown Milwaukee
Open year	1993	1996	1988
Types of provider	Medicaid and Medicare	Medicaid and Medicare	Medicaid and Medicare
Ownership	For-profit-corporation	For-profit-partnership	For-profit- corporation
# of beds	110	81	135
Median household income of the census tract where the facility locates (Compared with that of Wisconsin)	Higher	Much lower	Slightly lower

The first courtyard is in a nursing home called Silver Life, a for-profit organization owned by a small corporation. The facility is located in a city 15 miles west from downtown Milwaukee. Median household income of the census tract where the facility is located was 1.76 times more than that of Wisconsin in 2010. Silver Life participated in both Medicare and Medicaid. It provided 110 beds and housed 96 residents in 2013. Approximately 20 percent of the resident paid fees with Medicare and 33 percent with Medicaid, and the rest of them were private payers. The facility opened in 1993 and the courtyard was built together with building blocks.

The second courtyard is in Golden Age, a for-profit organization owned by a limited liability company (LLC) partnership. The facility provided Medicaid-and Medicare-service and 81 beds. There were 51 residents in 2013. According to its administrator, the majority of the residents paid fees with Medicaid in 2013 (over 90 percent during the research period), which caused financial hardship to the facility. Golden Age is located in a neighborhood 12 miles north from downtown Milwaukee. Median household income of the neighborhood was much lower than that of Wisconsin. The facility started in 1996 and the courtyard was built together with building blocks.

The third and final facility is Elderly Living, a for-profit organization owned by a large nursing home chain. The facility is located in a city 12 miles south from downtown Milwaukee. Median household income of the census tract where the facility is located was slightly lower than that of

Wisconsin. The facility accepted Medicaid and Medicare and provided 135 beds. It housed 124 residents in 2013; approximately 35 percent of the residents paid fees with Medicare and 65 percent with Medicaid. The facility opened in 1988. The courtyard was built later as an addition was added to the original structure around 1995.

IV. Data Collection

To collect data from the three subsystems of the courtyards as place, a mixed-method approach was employed. Flows of data collection are illustrated in Figure 4-1. Each of the three cases was designed with the same process. The first step was to obtain information of physical settings in terms of spatial properties, sensory properties and built features. Following that was collecting data regarding rules of place use (residents' behavior) and residents' outdoor experience. The last step involved acquirement of organizational and staff information. While conducting interviews, the researcher confirmed the data that had been collected about the physical settings and the residents. Summaries of interim data analysis were reported to administrators, activity director and/or staff in the three nursing homes. Their feedback helped finalize the interpretation of place experience of each courtyard.

A. Physical settings

There are many variables related to physical settings. The question is what variables need to be measured. Based on the 44 articles reviewed in Chapter 2, variables that have been discussed across the studies were selected and divided into spatial, sensory and built variable groups (Appendix A). To address these variables, three strategies: environmental inventories, photo documentation and auditing evaluation were utilized; they aimed to develop an objective description of the physical settings in addition to reflective analysis. Each strategy suggests different techniques and tools in obtaining information.

1. Archival research and checklist: data of spatial and built properties

Archival research focused on information derived from building and courtyard floor plans; spatial data in terms of dimensions, spatial sequence and indoor-outdoor spatial relations were particularly documented.

A courtyard physical-setting checklist (Appendix F) was developed to investigate spatial, sensory and built features. It examined spatial elements in terms of paths, sections, nodes and border, sources of five-sensory stimulation and fixed and movable built elements (e.g., furniture or a landmark). The checklist was modified from Moore's (2000) checklist created for describing interior environments of adult day care facilities. Compared with Moore's tool, the checklist paid attention to the spatial and sensory aspects of environments.

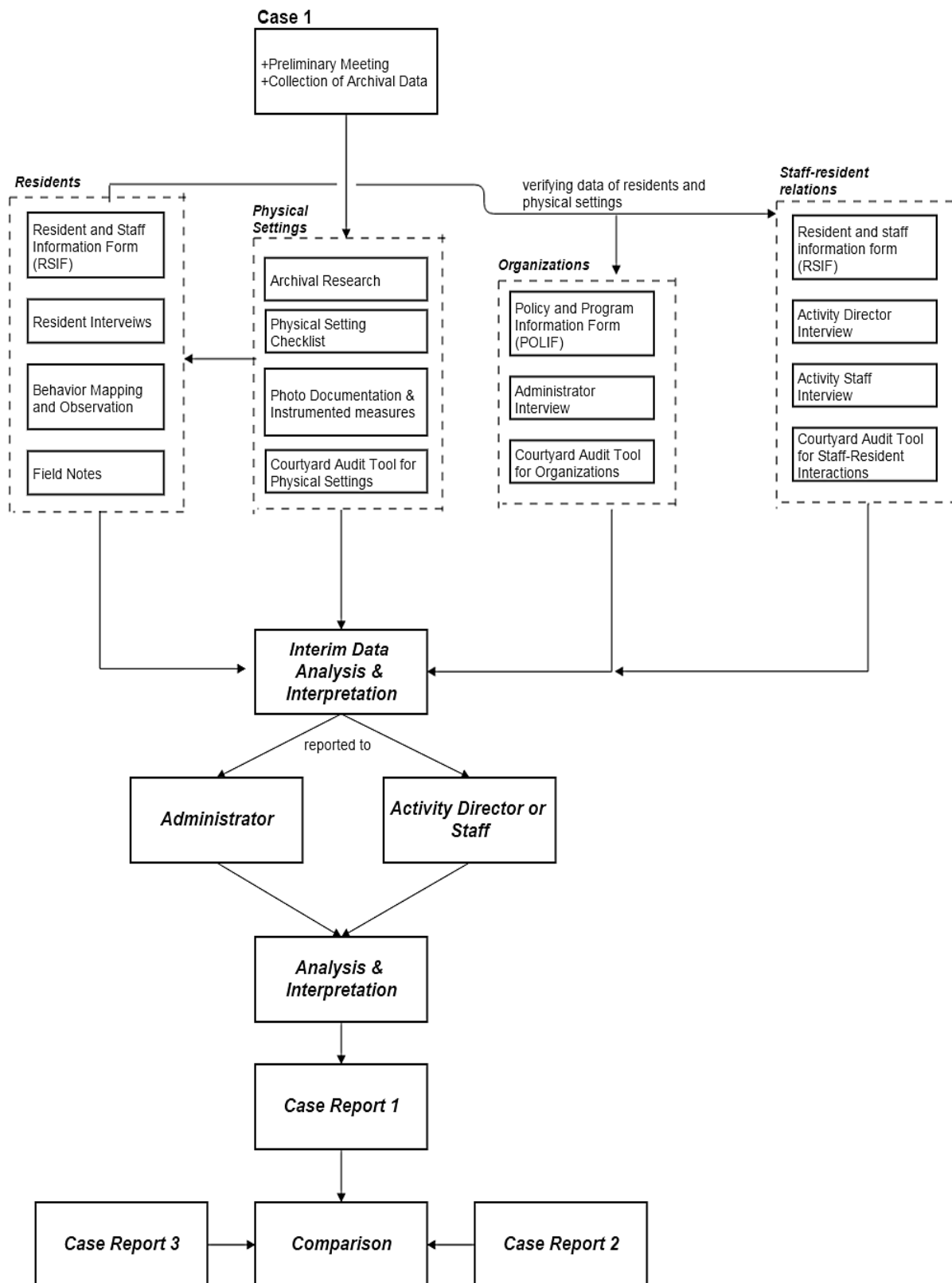


Figure 4-1. The flow of data collection

2. Photo documentation: data of trace observation and visual properties

Photo documentation achieved multiple tasks. First, it provided evidence for the physical-setting checklist. Photographs of the courtyards helped verify what has been recorded and inventoried. Second, it was a form of recording trace observation, an unobtrusive method of investigating human activities (Zeisel, 1984). This method combined with field notes is commonly used for assessing environments for older adults (Cutler, 2000). For example, Cooper and her colleagues (Cooper et al., 1991) recorded physical traces resulting from human activities by photographing them; the evidence verified interviews and observation data in post-occupancy evaluation of healthcare and long-term care settings. In this study, the data complemented behavior mapping and observation findings in understanding users' activities.

Third, digitalized images served as materials to describe color palettes of the three cases. Colors of the courtyards are viewed as one of major sources of visual stimulation. By utilizing color-analysis applications, digitalized images were reported in terms of color statistics. Images used in color analysis were taken by the same digital camera (Nikon D3000 with 18 to 55mm f/3.5-5.6G lens). Camera settings remain unchanged across the sites (i.e. white balance as direct sunlight, ISO sensitivity as 100, metering as spot, no flash, exposure value as -0.7 and an image size of 3872x2592 pixels etc.). Pictures for analysis were taken when the sunlight and skylight were the only light source.

Despite control of lighting and settings, many factors such as shooting angles and distance may influence representation of color samples; however, minor changes of shooting factors creates little impact on identification of dominant colors (Starešinič et al., 2011); color constancy remains in objects illuminated with natural light. Several studies have used a digital camera to identify colors of urban environments (Starešinič et al., 2011), street landscape (Shibata & Kato, 1998) and building façade (Caldieron, 2013; O'connor, 2006); although these studies had to overcome many technical issues, their findings provided a quantitative perspective in understanding color aesthetics.

3. Instrumented measures: data of auditory and tactile properties

Besides visual aspects of the courtyards, auditory and tactile properties were measured.

Auditory variable:

Simple auditory variables such as pitch, loudness, timbre and tempo create effects of sounds on hearing (Alvarado, 2011). Following previous studies on auditory experience of nursing homes (Bharathan et al., 2007; Calkins, 2002; Joosse, 2011), this inquiry focused on loudness or sound intensity levels. These studies were interested in loudness because of concerns of overwhelming auditory stimulation in nursing homes. The concerns are theoretically guided by Lawton's ecological model of aging (Lawton & Nahemow, 1973), suggesting older adults have a narrower span of adaption in corresponding to a given environmental press (e.g., auditory stimulation); if environments are unable to compensate for the losses of competence caused by the aging processes (e.g., loss of tolerance), residents will experience negative affect and maladaptation due to mismatch between the press and competence.

In the courtyards, major auditory sources included 1) nature sounds of wild life, 2) human background noise, and 3) noise from traffic, air conditioners, and machine. To measure sound levels, a DT-85A CEM sound level meter was employed. The meter offers measurement ranging from 40 to 130 dB with A-weighted measure with fast time weighting. A-weighting is a setting to calculate relative loudness (higher frequency) perceived by the human ear (humans in general are not very sensitive to low frequency sounds) (Joosse, 2011). Fast-time weighting is usually applied to measuring noise; it captures all the sound in environments that may vary over time (Schomer et al., 2001). During observation periods, sound levels were measured every half hour at a major activity area in each courtyard.

Tactile variable:

Tactile senses can be triggered by a light touch, body movement, temperature, and pressure. This study focuses on three tactile sources including 1) plant materials with tactile quality surface (e.g., tree bark), 2) wind and 3) temperature. Tactile stimulation is viewed as important components in therapeutic recreation activities; to increase sensory awareness and promote social interactions, nursing home residents are encouraged to interact with pets (Ruckdeschel & Van Haitsma, 2001) or participate in gardening activities (Gigliotti & Jarrott, 2005). Types of plants that trigger touch behavior were inventoried during observation periods. Analysis revealed their unique texture in producing tactile experience.

Different wind speeds or air flows may bring different senses of pressure. To measure wind speed, a La Crosse Technology EA-3010U handheld travel anemometer was used. It measures wind speeds ranging from 0.44 to 67mph. Wind speeds were sampled every half hour at the center of a major activity area in each courtyard.

To understand how warm/cold it is in the courtyards, two AcuRite outdoor digital thermometers (Model: 00799) were utilized. The meter is sensitive to temperature ranges between -4 and 158 Fahrenheit with accuracy of ± 2 degree. To measure temperature in the sun and shade, the first step is to place the two thermometers five feet above the ground in the shade until both devices show the same number and remain unchanged. Shade temperature was then recorded, and one device was moved to a spot five feet above the ground with direct sunlight. After five minutes, the number shown in the sun-soaked meter is record as temperature in the sun. The meter then brought back to the original shady spot. After the two meters show the same temperature number, one is ready to be placed at the same sunny spot again. The temperature was measured from 10:00 am to 5:00 pm every day during observation periods.

Olfactory & tasting variable:

Smell and taste do not lend itself to an easy quantitative understanding. Current research is limited to descriptive analysis in terms of typology. For example, odors that can be detected by human is categorized into 10 different smells (e.g., fragrant smells from flowers and chemical smell from gasoline) (Castro et al., 2013). Taste is divided with five basic tastes (sweetness, sourness, saltiness, bitterness and umami) or with 12 flavors (e.g., pungency, astringency etc.) (Glaser, 1999). Nevertheless, it is still worth pointing out sources of olfactory and tasting stimulation in outdoor environments. In the pilot study, some courtyards have fragrance from lilac bushes or the odor from cigarettes, and others have garden-grown food like herbs and vegetables allowing residents to taste their flavor and freshness.

Olfactory and tasting stimulation has been utilized as an intervention for disruptive behavior in nursing homes. Cohen-Mansfield & Werner (1998a) created an indoor natural setting with aroma diffuser with the smell of forests. Their results showed a trend toward less agitated behavior in such an enhanced environment. To reduce anxiety and improving mood for nursing home residents, Lantz et al (1997) provided aroma therapy and food-tasting activities in a stress management program. These activities were perceived by staff as effective interventions to maintain residents in a relaxed state.

4. Auditing evaluation: measure of experiential attributes of physical settings

To measure experiential qualities of physical settings, an auditing instrument called the Courtyard Audit Tool for Physical Settings was developed (Appendix G). The tool is framed by nine experiential attributes, each of which has several items to be assessed. Both the researcher and activity director were asked to complete the evaluation within each nursing home. Each item was assessed along a numeric scale from one (poor) to five (very successful). Results of the evaluation suggests how successfully physical settings support the nine attributes.

Items of the evaluation address variables of physical settings derived from the reviewed articles. As shown in Appendix A, the way that each variable is described by scholars implies particular desirable

experience they sought to achieve through improving the environmental factor. As discussed in Chapter 2, similar desired experiential themes were grouped and formed the nine experiential categories including 1) privacy, 2) social interaction, 3) accessible space & built features, 4) sensory stimulation, 5) safety & security, 6) familiarity, 7) information awareness & spatial orientation, 8) sense of ownership and 9) participation of meaningful activities.

A single variable may be linked with different experiential categories. For example, the topic of “location” is connected with information awareness & spatial orientation in Cutler & Kane’s (2005) study while it is involved with accessible space & built features in Kearney & Winterbottom’s (2005) research. Variables related to the same attribute were grouped and shown in Appendix E. The groupings became foundation of developing an audit tool to evaluate experiential quality of physical settings.

B. People component

People variables discussed across the previous studies were selected and divided into organizational and staff variable groups (Appendix B & C). The organizational variable group consists of four sections including organizational philosophy & culture, outdoor activity programs, outdoor policy and resources. The staff variable group comprises three parts: decision-making processes, role and responsibility and staff training. To address these aspects of the courtyards, facility-level measures, interviews and auditing evaluation were applied.

Residents were usually described in terms of functioning or cognitive levels; little social background was discussed. To portray residents more holistically, aggregated resident characteristic measures and resident interviews regarding past and current outdoor experience were employed. Detailed discussions of data collection are provided in the following sections:

1. Multiphasic Environmental Assessment Procedure (MEAP): Facility-level measures and aggregated resident data

Moos & Lemke (1994) developed five tools, Multiphasic Environmental Assessment Procedure (MEAP), to assess group living settings for older adults (see discussion in Chapter 3). Two of the five instruments of MEAP were applied in this study. The Policy and Program Information Form (POLIF) (Appendix H) was used to evaluate overall care programs, services and the degree of freedom of a facility. The Resident and Staff Information Form (RSIF) (Appendix H) measured staff resources and aggregated resident characteristics in terms of functioning abilities. The two forms provided quantitative descriptions of facility-level backgrounds, staff information and resident profile. The POLIF was filled by administrators and the RSIF was completed by activity directors.

Scores of POLIF and RSIF were often treated as independent variables in research on environmental assessment for older adults; they may predict resident activity participation or resident satisfaction of overall environments (e.g., Mitchell & Kemp, 2000; Zimmerman et al., 2005). In some descriptive studies, the forms provide primary understanding of the contextual background. For example, results of the forms helped Frank (2002) portray staff and administrators' views of environments in two assisted living facilities and allow comparison between the two.

2. Interviews: descriptive information of organization, staff and residents

One-on-one interviews with staff and residents were conducted within each nursing home. Interviews with administrators asked questions about organizational philosophy, structures, outdoor programs, outdoor policy and resources. Interviews with activity directors and staff focused on their practice. Resident interviews addressed experience of using the courtyards and also home gardening.

According to Yin (2013), interviews are very critical sources of case study information. The purpose of interviews is to reveal "interpretations and opinions about people and events or their insights, explanations, and meanings related to certain occurrences". Burgess (1984 cited in Holloway,

2005, p. 39) defines interviews in qualitative research as “conversations with a purpose”, which capture people’s opinions, perceptions, feelings and experience (Holloway, 2005). Most of interviews for qualitative research are semi-structured so researchers can “pursue a consistent line of inquiry” but also maintain flexibility in conversations (Yin, 2003, p.89).

All interviews in this study were semi-structured. Interview guides helped to ensure that the same protocol was followed (Creswell, 2009). An interview with staff usually lasted one and half hours. A slide show of courtyard pictures was utilized for stimulating conversation. An interview with a resident usually lasted 30 to 40 minutes. Visual aids such as pictures, a flower catalog and a potted flower helped residents remain focused and stimulate reminiscence of home gardening.

3. Auditing evaluation: measures of experiential attributes of organization and staff-resident interactions

Following the same process of developing the auditing instrument for physical settings, tools for evaluating organizations and staff were created. The Nursing Home Courtyard Audit Tool for Organization (Appendix I & J) was completed by the researcher and administrator individually within each nursing home. Results of the evaluation suggest how successfully the organizations shape the nine experiential attributes. The Nursing Home Courtyard Audit Tool for Staff-Resident Interactions (Appendix I & K) was conducted by the researcher and activity staff separately within each nursing home. Results describe how the nine experiential attributes are catalyzed by staff’s practice.

C. Rules of place use

Rules of place use are composed of behavior patterns guided by mixture of laws, regulation, customs and habits associated with usage of the courtyards. They suggest socially agreed behavior and define appropriateness of action. Moore (2000) used behavioral mapping and field notes to disclose internal rules of three adult day care facilities. In his study, patterns of the internal rules shaped place experience in terms of control, sociality, orientation and stimulation. A facility with more patterns that

have a positive influence on these attributes is perceived as successful. A similar method was applied by Geboy (2005); patterns of behavior were revealed in different indoor activity spaces of an adult day care facility.

1. Behavioral mapping

Behavioral maps are “descriptions of behavior and of participants and statements relating the behavior to its physical locus” (Ittelson et al., 1970, p. 658); behavior mapping is a technique for studying relationships between behavior and environments. To conduct behavior mapping, a plan for the courtyard layout was modified in a graphic format suitable for behavior mapping and field note documents. Observed behavior was labeled on the plan; the label reveals categories of behavior, physical location and information of observed targets.

In this study, snapshot observation (or instantaneous observation in Ittelson’s term) was conducted with a 30-minute interval. This means the observer gave a quick look and recorded the behavior occurring in the courtyard every 30 minutes. This type of observation is different from continuous observation— researchers observing behavior over longer periods of time—which allows recording the duration and flow of activities; however, it will lose information of behavior variance if there are not enough observers.

Besides floor plans of the courtyards (Appendix L), behavior mapping also requires a behavior checklist (Appendix L). In this checklist, each target was assigned a number with identified information such as gender, mobility, behavior category and group types; the number is then labeled in a behavior map with notations. Data of the checklist were input in SPSS for data analysis, and data of behavior mapping were translated into descriptive narratives. At least six observation days (over 40 hours) were spent in each of the courtyards. If the weather was permitting, observation took approximately six hours per day.

2. *Field notes*

Field notes were taken during observation intervals. Contents included researcher's personal narratives of the courtyards, interactions with courtyard users, and descriptions of particular behaviors. Notes are in written and graphic form. They were noted on the floor plan to indicate physical locus, time and action. Field notes were organized and reviewed at the end of every observation day; data was input to a day-based Excel spreadsheet.

V. Data Analysis

The analyses of archival research, the checklist of physical settings, photo documentation and instrumented measures help create a relatively objective description of physical environments. The analyses of MEAP and interviews with administrators, directors, staff and residents help construct objective and subjective knowledge of the courtyards. Behavior mapping data and field notes revealed a consensual understanding of the courtyards. Narratives of behavior as rules of place use were translated into experiential descriptions and evaluated in terms of influence on the experiential attributes.

Preexisting knowledge informed missing information regarding what an institutional outdoor setting feels like and which one has better practice. The analyses of auditing evaluation together with evaluation of place rules helped fill in the missing pieces and created a holistic interpretation of the three courtyards.

1. *Analysis of archival research and the checklist*

The analyses of archival research and the physical-setting checklist were carried by two means: environmental inventories and spatial analysis applications. Information generated from the checklist and floor plans was inventoried; data of spatial variables such as spatial compositions, size, dimensions, and density, sensory variables and built & human-made features was listed in a summative table for between-cases comparisons and for comparisons with current regulation regarding physical design of nursing homes.

Two spatial analysis applications: NodeXL and UCL Depthmap were applied. Architectural layouts were analyzed using the NodeXL, a newly developed free software tool based on graph theories and a complex of algorithms. It helps quantify spatial relationships into graph metrics (Table 4-2) and creates a graph structure allowing visualization of spatial links (Hansen et al., 2010). The graph is composed of a set of points (vertices) connected by edges (an edge as a line connecting two vertices). It performs tasks similar to a “justified graph”, a space syntax analysis proposed by Hillier & Hanson (1984). Hillier’s space syntax is also framed by graph-theoretic principles, which defines graphs as mathematical entities with a set of vertices and edges between them (Batty, 2004). The vertices and edges describe a set of relationships and form a network. Analysis of a network includes information of graph metrics such as network boundary, size, shape and density. Space syntax is thus perceived as “an extension of network analysis concepts into architecture and urban planning” (Ratti, 2004, p. 4).

The NodeXL offers similar functions. It provides an approach allowing a quantitative understanding of a spatial network. The software has been widely used to analyze and visualize spatial structures of virtual communities (e.g., Ahn et al., 2011; Himelboim et al., 2013). Although it has not been considered in analysis of a real-world spatial structure, similar graph-theory-based software like SpiderWeb has been applied in a space-syntax analysis of street networks (Vasku, 2013) and generation of architectural design (Schaffranek & Nourian Ghadikolaee, 2014). A major reason to use the NodeXL is that it is designed as open-source program characterized by intuitive operation. Spatial composition and indoor-outdoor spatial relations of the three cases will be interpreted based on results presented in a graphic metric table and a graph of spatial networks.

Table 4-2. Definition of NodeXL metrics (Hansen et al., 2010)

Degree	Degree refers to the number of unique edges connected to a vertex. A vertex with a highest value of degree suggests it is the center of a spatial network and has the strongest connection with other points. It is assumed that a great amount of information exchange and interactions occurs in this point.
Geodesic distance	Geodesic distance is the distance between two vertices; it refers to the number of edges in a shortest path connecting them. In terms of an architectural layout, geodesic distance from an entry point may represent measurement of spatial depth. A higher value of that may suggest a place be located deep to the building.
Closeness centrality	Closeness centrality is a measure of an average shortest distance from each vertex to each other vertex. It describes how close a vertex is to others in a network. NodeXL calculates it as the inverse of the average of the shortest distances; therefore, a point with a highest value suggests that it has a quickest connection with other points on average. In terms of an architectural layout, a place with a highest value of closeness centrality suggests it has the easiest and simplest way of connecting with other spaces. People at that point may take the least amount of effort to travel to another place.
Betweenness centrality	Betweenness centrality is an indicator of a vertex's importance in bridging between different clusters within a network. A node with high betweenness centrality has a great influence on uniting the network. In terms of an architectural layout, a place with high betweenness centrality may serve as a point of connecting two units, each of which has its own resources. If the place is removed, internal communication may fall apart.
Eigenvector centrality	Eigenvector centrality is a measure of a node's ability in connecting other nodes with a high connectivity. It suggests how easily a node is influenced or receiving information from other places. In terms of an architectural layout, a place with eigenvector centrality may be adjacent to a busiest street or spot; however, the place itself may be very isolated and have limited connection with other spaces.
Clustering coefficient	Clustering coefficient is a measure of the extent to which nodes in a network are tied together. Architecturally, an architectural layout with high clustering coefficient suggests spaces tend to create tightly united groups with strong internal connections.
Graph density	The density describes the degree of inter-connection among vertices in a spatial structure. In a graph, if all points are connected, the density is calculated by dividing the number of total edges by the maximum number of possible edges. A structure that has a lower density means that each point is weakly connected and engaged. A radial architecture layout may belong to this category. In other words, people at one point of this structure have very low potential to know, observe and participate in their surroundings.

Visual access of the courtyards was analyzed by UCL Depthmap, an open-source software tool of space syntax; it is developed to understand spatial networks of architecture and urban space (Hillier, 2012). Depthmap was created by Alasdair Turner at the University College London based on graph theories. It produces several configurational analyses including visibility map (visibility analysis, depth-path analysis and isovist analysis), axial maps and segment analysis. In this study, the visibility map was

applied; the analysis theorizes space as composition of thousands of two-dimensional grid squares; at the center of a grid square is a connecting point, whose visibility is decided by how many other points have visual connection with it. A place with higher visibility means that it has more points with visual-connection with others. Hiller (2007) described that Depthmap is the most significant tool to “syntacticise” visibility in graph analysis; many studies (e.g., Hoĝlscher et al., 2012; Li & Klippel, 2014; Lu et al., 2009) have applied it to understanding wayfinding in different forms of architecture layouts.

2. Analysis of photography and instrumented measures

Analysis of photo documentation and instrumented measures is to provide quantitative descriptions of sensory properties.

Analysis of colors

Images for color analysis were taken by a digital camera and uploaded to a computer installed with color analysis applications. Color was analyzed in terms of the HSB (Hue, Saturation and Brightness) color model. The reason of using a HSB color model rather than the computer vision of RGB (red, green, blue) or printers’ color value of CMYK (cyan, magenta, yellow, and black) is that HSB is more appropriate to describe colors perceived by the human eyes. The human eye and brain naturally break down colors into hue, saturation and brightness according to physiological criteria (Sarifuddin & Missaoui, 2005). Scholars like Cubukcu & Kahraman (2008) and Shibata & Katohave (1998) have used this model to describe colors and evaluate color preference of building exterior.

Hue is the name of color such as green, red and yellow; it is a measure indicating a location on 360-degree standard color wheel representing wavelength within the visible-light spectrum (Lake & May, 2012). Saturation is the intensity or strength of color. It is defined as the percentage of gray in a color and reported in a range from 0 (gray) to 100 (full colors) (Holtzschue, 2012; Hunt, 2012). Brightness refers to a degree of lightness to the hue; “black” means zero percent of brightness, and “white”

contains 100 percent (Lake & May, 2012). Values of HSB and RGB are interchangeable; hue, saturation and brightness can be transformed into raw R, G and B ranging from 0 to 255 (Samko, 2010).

The reason of calling HSB “a color model” is that a color can be mathematically mapped into a cylindrical symmetry (Figure 4-2) using a set of numbers. The hue angle starts at 0° (red), and then ends at 360° (red). A hue with a value of zero is equivalent to hue with value of 360. A saturation level starts from the central point of the color wheel (0%, value=0) to the circle edge (100%, value =1); one-hundred-percent saturation suggests a color has a highest purity or intensity. The central vertical axis denotes brightness ranging from black at the bottom (0%, value=0) to white at the top (100%, value =1). Given these parameters, a color like “dark khaki” is expressed as “60°, 50%, and 70%”.

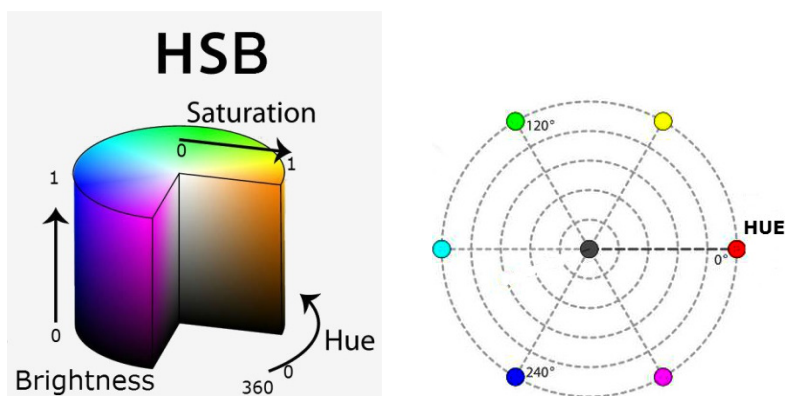


Figure 4-2. HSB color model. Reprinted from HSL and HSV, 2015, retrieved from http://en.wikipedia.org/wiki/HSL_and_HSV

Color analysis was conducted by two software tools: ImageJ (Image Processing and Analysis in Java) and Image Color Summarizer. The former was developed at the National Institutes of Health (NIH) for analysis of fluorescence microscopy or radiological images (Research Services Branch-National Institute of Mental Health, 1997). Although it was designed for biological analysis, it has been recommended by photographers to understand color composition of digitalized pictures (Jannefoo, 2012). The latter was created by Martin Krzywinski, a scientist of bioinformatics at BC Cancer Agency in

Vancouver, who is interested in visualization of biological data (Krzywinski, 2006). It has been applied to botanic research on differentiating species (e.g., Sanz et al., 2012) and to the analysis of architecture façades (Caldieron, 2013).

The ImageJ visualizes color distribution with a HSB histogram and color 3D model. A HSB histogram (Figure 4-3) shows distribution of pixels in different levels of hue, saturation and brightness. A color 3D model visualizes an overall color pallet of an image in a cylindrical geometry. It tells a color's frequency (in terms of size of a color ball) and location corresponding to its mathematic value.

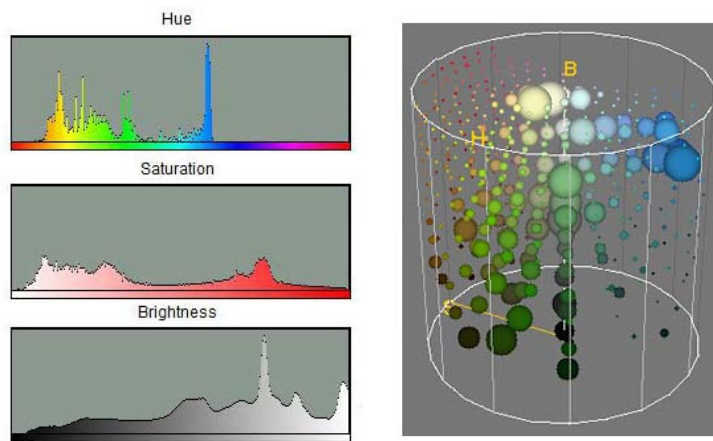


Figure 4-3. A HSB histogram (left) and color 3D model (right) generated by ImageJ

The Image Color Summarizer calculates a mean, medium, minimum and maximum value of hue, saturation and brightness from overall pixels. These values are reported with their corresponding color swatch (Figure 4-4) and a color description like “pure light green”. The description of color is based on the criteria shown in Figure 4-5:
















	avg	med	min	max
h	114 (green) 26,255,0 #1aff00 	209 (blue) 0,132,255 #0084ff 	10 (red) 255,43,0 #ff2b00 	250 (blue) 43,0,255 #2b00ff 
	43 (faded) 156,255,145 #9cff91 	34 (faded) 168,213,255 #a8d5ff 	2 (drab) 255,251,250 #fffffa 	100 (pure) 43,0,255 #2b00ff 
	63 (medium) 16,161,0 #10a100 	65 (medium) 0,86,166 #0056a6 	4 (dark) 10,2,0 #0a0200 	100 (bright) 43,0,255 #2b00ff 
	114,43,63 98,161,92 #62a15c 	209,34,65 109,139,166 #6d8ba6 	10,2,4 10,10,10 #0a0a0a 	250,100,100 43,0,255 #2b00ff 
hsb				

Figure 4-4. Example of statistic results produced by Image Color Summarizer

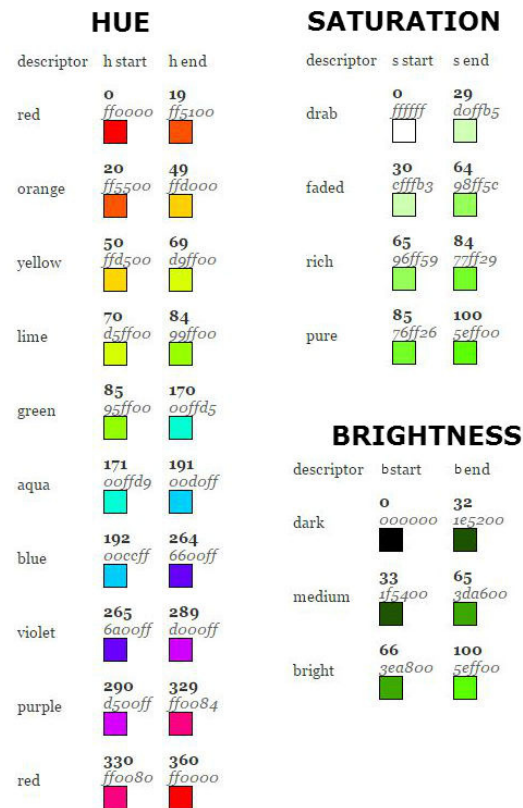


Figure 4-5. Criteria of color descriptions in Image Color Summarizer (Krzywinski, 2006)

Analysis of sounds, temperature and wind speeds

Data collected from the three devices: a sound level meter, an anemometer and two outdoor digital thermometers were analyzed by descriptive statistics method. During observation periods, sound levels were measured every half hour in each courtyard. A mean value of sound levels was compared with sound quality standards defined by the National Institute on Deafness and Other Communication Disorder (NIDCD) and the Environmental Protective Agency (EPA) to evaluate quality of auditory environments.

Wind speeds were sampled every half hour. A mean value of wind speeds was compared with the Beaufort scale. The scale is the most commonly used criteria of assessing wind and human experience; it has been used to evaluate pedestrian wind environments around buildings in several studies (e.g., Penwarden, 1973; Sanz-Andres & Cuerva, 2006). Temperature in the sun and shade was measured every 30 minutes from 10:00 am to 5:00 pm during observation periods. A mean value of temperature was compared with air temperature reported by the National Weather Service (NWS) and also state-level requirement of indoor thermal comfort of nursing homes. The comparison was to show a discrepancy between local and NWS air temperature values, and difference between the outdoor temperature and regulated safe thermal level for older adults.

3. Analysis of MEAP and interviews with staff

Scores from the Policy and Program Information Form (POLIF) and the Resident and Staff Information Form (RSIF) were calculated following Moos and Lemke's formula. The POLIF has eight sections: 1) expectations for functioning, 2) acceptance of problem behavior, 3) policy choice, 4) resident control, 5) policy clarity, 6) room privacy, 7) availability of health services and 8) availability of daily living assistance, each of which was described as a percentage value, representing the extent of particular resources that a facility provided. Results of the POLIF produced background knowledge of facility-level contexts and allowed comparison between the cases. The manner was applied in analysis of the RSIF. Results of RSIF were taken into account types of care services, turnover rates, training resources and volunteer hours.

Contents of interviews with the administrators, activity director and staff were organized in a way that helped describe several organizational and staff variables perceived as important in the reviewed articles. The analysis focused on management and operation of the courtyards and revealed how the courtyard was intentionally planned. It also addressed staff's interpretation of the courtyards and discrepancies of perception between staff members in outdoor policy, programs and care delivery.

4. Analysis of behavioral data and field notes

Behavioral data was analyzed using SPSS software and also through a coding process. Data from the behavioral observation sheet was input into SPSS software for a descriptive statistical analysis. A general pattern of courtyard use was produced in terms of person-times of visitors, users' gender, mobility levels, group types, and forms of activities. Results of the analysis were cross referenced with data from staff interviews to understand how the courtyard was actually used.

Mapped behavior was translated into narrative descriptions of the rules of place use. The data together with field notes were analyzed in two coding processes: descriptive coding and pattern coding (Miles & Huberman, 1994). The first step was "summarizing segments of data" (p. 69), a procedure of identifying and labelling what is in the data. Rules with similar goals were clustered and assigned a code. Codes with similar purposes are grouped into a higher or broader category (sub-themes). The process is "a way of grouping those summarizes into a smaller number of sets, themes or constructs" (p. 69), which helps researchers develop a cognitive map or schema for interpreting and interconnecting the groupings (Miles et al., 2013).

Sub-themes emerging from the coded segments were clustered by the nine attributes. Rules grouped under an attribute were evaluated as being negative or positive to the attribute. A summary of positive and negative scores indicates the extent that an attribute is supported by place rules.

5. Analysis of resident interviews

Resident interviews were conducted to understand experience of the nursing home courtyards and home gardens and gardening. Twenty-one residents (six males and 15 females) of Silver Life, fifteen residents (six females and nine males) of Golden Age and seven residents (one male and six females) of Elderly Living participated in the study. Most of the residents had few comments of the courtyards; they were not aware of the existence of the space or not able to recall related-memory. They had little information to share even if interviews were conducted in the courtyards. On the contrary, most of the

residents were able to retrieve memories of their home gardens and gardening. Their stories were digitally recorded and transcribed to the written form for content analysis. Several sub-themes emerged from coded segments of the 43 interviews. They were grouped by the nine attributes and analyzed in terms of frequency. It is assumed that the higher the frequency of sub-themes under an attribute the more important the attribute is deemed to be.

6. Analysis of auditing evaluation

The three auditing evaluation tools: the Courtyard Audit Tool for Physical Settings (CATPS), the Courtyard Audit Tool for Organization (CATO) and the Courtyard Audit Tool for Staff-Resident Interactions (CATSRI) were completed by the researcher and staff respectively. The CATPS has 76 items grouped under the nine experiential attributes. The raters were asked to responses on a 5 point Likert scale. The CATO and CATSRI comprise 42 and 45 questions respectively. They were constructed and evaluated in the same manner with CATPS.

Discussions focused on the difference of the score between the two raters. A comparison of the researcher's scores between the cases reveals which facility provides more organizational, staff and environmental support of the desired experiential attributes.

7. Interpreting place experience: synthesis of data

The purpose of synthesizing different sources of data is to portray place experience holistically. Synthesis is involved in several steps, which transform data into experiential descriptions. First, in each auditing evaluation (CATPS, CATO and CATSRI), the researcher's scores of each attribute were calculated into three percentile rankings (top, middle and bottom third rankings). Scores of each attribute in the evaluation of place rules was also calculated in the same manner. The juxtaposition of the four evaluation results helped identify attributes that are consistently emphasized or neglected by the three sub-systems of a courtyard. A comparison of the analysis between the courtyards disclosed attributes that were valued or overlooked collectively across the settings.

Third, the analysis of interviews of home-garden experience showed the frequency of themes under each attribute. The frequency was converted into three percentile ranking groups (top, middle and bottom third rankings). A comparison of the experiential priority between home gardens and the three courtyards may reveal a fundamental difference between home and institutional outdoor settings. Finally, to understand which courtyard is more successful, actual scores of the nine attributes in each evaluation were compared between the cases. A courtyard that has higher and more equal support of the nine attributes is perceived as successful. Its underlying pattern of contexts was discussed.

CHAPTER 5 : PHYSICAL SETTINGS OF THREE NURSING HOME COURTYARDS

Chapter 3 presented a model of experiential outdoor environments of nursing homes (Figure 3-15). Physical settings were conceptualized as a complex with three properties: spatial properties, sensory properties and building systems. Chapter 4 described the data collection and analysis of these properties. This chapter provided the results of analysis of physical settings. The findings included objective and consensual descriptions. The former presented the results of quantitative analysis, and the latter described the results of auditing evaluation of physical settings in supporting the nine attributes. As elaborated in Chapter 4, the auditing evaluation reflects not only rater's subjective judgement but also common-ground knowledge established in pre-existing research. A comparison of auditing scores between the cases suggests shared or social-agreed aspects of physical characteristics.

I. Properties of Physical Setting

Different spatial, sensory and building-system variables of institutional outdoor environments were discussed in Chapter 2 (Appendix A). Variables that help differentiate between the cases are discussed in the following section.

A. Variables of spatial properties

Selected variables of spatial properties are divided into four variable groups: 1) indoor-outdoor relations; 2) spatial arrangements; 3) size and 4) density (Table 5-1). Indoor-outdoor relations describe how a courtyard is connected with its surrounding buildings; spatial depth, spatial connection and visibility are three major factors. Spatial arrangements are associated with layouts, entry points, paths, and the variety of activity space. Size and density factors describe the scale of outdoor space. The data

was collected through archival research on floor plans and a checklist of physical settings. Data was analyzed using two software programs: NodeXL and UCL Depthmap.

Table 5-1. Variables of spatial properties

Variables	
Indoor-outdoor relations	<ul style="list-style-type: none"> • Location (spatial depth) • Spatial connection • Visual connection with indoor spaces
Spatial arrangement	<ul style="list-style-type: none"> • Layout (paths, sections, boundary etc.) • Entry points • Variety of activity space
Size	<ul style="list-style-type: none"> • Hard-surface areas • Green areas
Density	<ul style="list-style-type: none"> • Square footage of facility's overall outdoor space • Square footage of facility's secured outdoor space • Square footage of activity (patio & porch) space

B. Variables of sensory properties

Selected variables of sensory properties are divided into groups based on their relations with five-sense experiences (Table 5-2).

Table 5-2. Variables of sensory properties

Variables	
Visual	<ul style="list-style-type: none"> • Color, saturation and luminous contrast of plants, furniture, architectural facade and paving
Auditory	<ul style="list-style-type: none"> • Sounds level of water features, machine, vehicles and other background noise
Tactile	<ul style="list-style-type: none"> • Touch: types of natural material with tactile quality surface • Sense of heat/coldness: environmental temperature • Sense of pressure: wind (air pressure)
Taste and olfactory	<ul style="list-style-type: none"> • Flavors: garden-grown food • Fragrance: natural materials with aroma • Chemical odor or pungent smell: human-made features providing olfactory stimulation

- ***Visual variables:***

This study focuses on hue (color), saturation and luminous contrast of courtyard objects. Although shapes and forms can also trigger visual experiences, hue is often used to define objects or places and express preference for them. More specifically, color may be the most noticed attribute associated with defined objects (Holtzschue, 2012). People describe things with their color like a red umbrella, an orange flower pot and a blue dress. Descriptions sometime contain themes of aesthetic evaluation such as “vivid”, “rich”, “light”, “drab”, “pure” or “clean” (Canter, 1977, p. 109). These themes suggest color data in terms of hue, saturation and brightness. For example, vividness, richness and drab may be associated with levels of saturation of an object; lightness is concerned with levels of brightness of an environment; purity may refer to a color with full intensity. In other words, a place’s color information serves as important references of evaluation.

All natural or human-made objects contain colors. Understanding color-pallets of a courtyard may help understand how the courtyard is planned and managed with different resources. Simply speaking, color arrangements of a courtyard imply how the courtyard is programmed for spectators.

Images for color analysis were taken by a digital camera (Nikon D3000 with 18 to 55mm f/3.5-5.6G lens). The settings of the camera were described in Chapter 4. Each courtyard was taken in long, medium and close-up shots with different angles. Photos that were selected for color analysis show the best expressions of the courtyards. They contain a variety of color objects and plant materials as well as a full view of the settings. Digitalized images were processed using two software tools: ImageJ and the Image Color Summarizer. Results were presented in terms of values of hue, saturation and brightness.

- ***Auditory variable:***

A loudness or sound intensity level of each courtyard was measured. A CEM sound level meter DT-85A was employed. Collected data was compared with standards defined by National Institute on Deafness and Other Communication Disorder (NIDCD) and Environmental Protective Agency (EPA).

- ***Tactile, olfactory and tasting variables:***

Plant materials with tactile quality surfaces (e.g., a tree bark) were inventoried. Potential sources of olfactory and tasting stimulation were described. The wind speed and outdoor temperature were measured using a travel anemometer and two outdoor digital thermometers respectively. Data of the wind speed were compared with the Beaufort scale to understand strength of the wind and human comfort. Data of the outdoor temperature in the sun and shade were compared with the air temperature reported by the National Weather Service (NWS) and also state-level requirement of indoor thermal comfort.

C. Variables of building systems: built & human-made features

Built features in the three cases are categorized into seven groups: 1) wheelchair friendly features, 2) weather protection structures/devices, 3) animal & plant supplies, 4) cultural symbols, 5) furniture, 6) water features and 7) information and communication device (Table 5-3). Wheelchair friendly features include devices and equipment that facilitates wheelchair movement. An automatic door with an opener and one-level paths are common outdoor features. Weather-protection structures/devices discuss outdoor elements that help reduce influences of the weather on outdoor uses. For example, umbrella table sets and a pergola may help cool air and sustain longer outdoor stay. Animal and plant supplies are resources that attract animals and enhance visibility of plant materials. Application of these resources such as birdfeeders and shepherd hooks may suggest how flexible an organization is to allow residents or staff to decorate courtyard space.

Furniture refers to patio furniture sets and outdoor accessories. The amount of furniture may indicate the extent to which social activities are encouraged in a courtyard. Water features refer to a pond or fountain with water sprays producing water sounds. Cultural artifacts refer to ornaments that may produce historical meanings with regard to a particular time or social group. For example, farming equipment is one of common objects decorated in the courtyards. They can trigger conversations and

facilitate reminiscence. Information devices refer to a clock or thermal meter. They help residents to realize time and temperature before they decide to venture further out in a courtyard. Communication devices are concerned with whether a courtyard has any instrument facilitating surveillance from the inside or allowing residents to contact indoor staff. An emergency communication device, an electronic bell or a monitor belong to this category.

Table 5-3. Building system variables

Variables	
Wheelchair friendly features	<ul style="list-style-type: none"> • Wheelchair touch pad/automatic door • One-level paths • Raised bed/ planters • Handrail
Weather protection	<ul style="list-style-type: none"> • Umbrella table sets • Pergola/Gazebo/Arbor • Porch
Animal & plant supplies	<ul style="list-style-type: none"> • Bird feeder, bird houses or bird baths • Trellis/ lattice/ container/plant supplies
Cultural symbol	<ul style="list-style-type: none"> • Flag • Sculptures • Farming equipment
Outdoor furniture	<ul style="list-style-type: none"> • Movable mesh aluminum tables and chairs • Moveable wicker or plastic chairs • Two-person bench • Hat & cushion storage box • Ashtrays • Toilet
Water feature	<ul style="list-style-type: none"> • Water pond or fountain
Information and communication device	<ul style="list-style-type: none"> • Thermal meter or clock • Emergency communication device or monitor

Built and human-made elements were summarized in a table for cross-case comparison; discussions focus on the amount, quality and functions of these features.

D. Support of experience attributes

The Courtyard Audit Tool for Physical Settings (CATPS) (Appendix G) was employed to evaluate physical environments in supporting the nine attributes. The CATPS has 76 items grouped by the nine attributes. Two raters (the researcher and activity director of each nursing home) were asked to respond to the items on a 5 point Likert scale. A comparison of scores between the two raters is made to understand discrepancies between research-based and managerial expectation. A case-comparison of the scores is conducted to reveal shared experiential qualities.

II. Courtyard at Silver Life

A. Overview of facility building

Silver Life is located in a city 15 miles west from downtown Milwaukee. It is covered in a census tract that had 2,119 residents with Caucasians over 85 percent. According to United States Census Bureau (2010), approximately 17 percent of population was aged 65 and older. The median household income in this tract (\$92,578) was higher than that in the tracts where the other two cases resided; it was also higher than that of Wisconsin (\$52,627). The majority of male labor force was involved with “management, professional, and related occupations” (65.8%) and “sales and office occupations” (20.42%). Same pattern was also found in female employment.

Silver Life opened in 1993. It connects with a small industrial area at the south, and faces residential neighborhoods characterized by one-story or two-story detached houses at the east. An 18-acre nature preserve with a river weaving through it is adjacent to the property. The facility is a one-story, “b”-shaped building. Its ranch-style exterior — mansard roofs with gray shingles and red-brick walls with windows framed by white grid patterns — creates a residential feel. The building areas have approximately 50,000 square feet supplying 110 certified beds and housing 96 residents in 2013.

The architecture layout is a double-loaded corridor plan with a courtyard at the center (see Figure S-1 in Appendix S). Its spatial relationships were analyzed using NodeXL, and the results were presented in a graph and a metric table (see Figure S-2 & Table S-1 in Appendix S).

According to the results, the building configuration of Silver Life can be summarized into two major features: 1) separation of external from internal areas and 2) a centralized layout. These features are introduced in discussions of its four corridors and social space in Appendix S. Overall, residents are required to walk a long distance to access to amenities (e.g., the courtyard) and participate in activities.

B. Physical settings of the courtyard

This section provides descriptions of Silver Life's courtyard in terms of spatial, sensory and building-system properties. Overall, the courtyard has relatively simple and recognizable spatial configuration. It is rich in sensory stimulation. It has the most abundant built and human-made resource in accommodating different social interactions and outdoor activities.

1. Spatial properties

In general, the courtyard is excellent in visual connection with indoor space. Its spatial organization is legible and allows easy navigation. The courtyard has a generous size and an adequate depth in minimizing harm to bedroom privacy at the inner ring of corridors. Crowdedness may not be an issue in the courtyard. Its square footage per bed for outdoor space outperforms standards defined in codes of Wisconsin, Massachusetts and Connecticut.

1) Indoor-outdoor relations

▪ *Physical connection: geodesic and physical distance*

The building layout of Silver Life may create disparity of using the courtyard between residents living in the different corridors. It favors access from Corridor A and Corridor C but delays visits from Corridor B.

The courtyard's connection with major indoor spaces is listed in Table 5-4. The courtyard is located deep to the entry with five geodesic distances from it. In other words, residents would pass four points (places) before arriving in the entry. Such depth may prevent residents from wandering out.

Residence corridors vary in access to the courtyard. Corridor C has an easier way due to a short geodesic and physical distance. Residents in Corridor B & D may spend more mental and physical efforts in navigation. The longest travel distance from a resident room to the courtyard space is 240 feet. This room is located at Corridor B.

The courtyard has indirect links with major indoor social spaces. It is three geodesic paths (i.e. three connecting paths in the graph) away from the activity room and dining space. Given the spatial depth, activity staff may feel challenged when working in both outdoor and indoor activity spaces. Nevertheless, the courtyard is in a short walk from these spaces. Visiting a courtyard after a meal should not be too challenging to some residents. In addition, the courtyard is located on the way to returning to Corridor C & D, residents in the two corridors would have more opportunities to visit the courtyard or to be aware of on-going outdoor activities. Corridor B has neither access nor visibility advantages.

Table 5-4. Distance between the courtyard and major indoor spaces in Silver Life

	Geodesic distance	Physical distance (ft.)
Entry porch	5	68
Corridor A	2	17 to 170
Corridor B (residence)	3	176 to 240
Corridor C (residence)	2	30 to 167
Corridor D (residence)	3	184 to 236
Activity room	3	66
Chapel/Library	1	adjacent
Dining room	3	52
Day room 1	3	84
Day room 2	3	155
Nursing station	3	142

- ***Visual connection:***

Three analyses including visibility analysis, depth path analysis and isovist analysis were employed to understand visual connection. Results showed that Silver Life's courtyard is highly visible from public or private space at the inner ring of the corridor. However, good visibility may compromise privacy. Privacy of four bedrooms close to the patio may be invaded due to a narrow visual buffer zone.

More specifically, the Depthmap visibility analysis reports that the center of the courtyard is the most visible place in the facility (Figure 5-2). In the analysis, visibility is expressed with a color ranging from blue, for low, through green, yellow to red. The courtyard in general has higher visual connection. People may be highly aware of an activity held in the central patio.

To understand which space has direct visual connection, the depth-path analysis was conducted. Figure 5-3 shows visual depth with a reference point at the center of the courtyard. "Depth 1" means a direct visual access; "Depth 5" indicates higher visual depth, suggesting that one has to turn often to see the courtyard. According to the analysis, "Depth-1" indoor social space includes the activity room, library/chapel, activity alcove and family private meeting/dining room. Resident rooms at the outer ring of the corridors are "Depth-2" or "Depth-3" space; people have to pass through several places to obtain outdoor information.

Detailed isovist analyses illustrate the angle of outdoor view from a specific indoor point (Figure 5-4 to Figure 5-8). People at the activity alcove, family private meeting/dining room and OT/PT room are able to capture most of activities at the center of the courtyard. The activity room and day rooms have a narrow field of view to the courtyard. Resident rooms at the inner ring of corridors vary in angle of outdoor view. Rooms with the best and widest view out toward the courtyard are located at the middle of Corridor B & D. The hallways at Corridor B & D have no visual connection with the courtyard (Figure 5-8). No public space in the hallways has views out toward the courtyard.

Too much visibility may impact on privacy. According to Marcus & Barnes (1999a), the outdoor space should have at least 30 feet deep to prevent a “fishbowl” effect (experience of being stared and watched by people). The depth may also make people at the inside feel private because bedrooms are less likely to be peeked from the courtyard. Marcus & Barnes (1999) also suggested that a buffer zone with at least 20 feet in front of bedroom windows makes views into windows become unclear. As shown in Figure 5-9, Silver Life’s courtyard is wide enough to reduce feelings of being overly-exposed; however, a small portion of activity space is within 20 feet from four bedroom windows. To maintain privacy, residents in these bedrooms may have to pull down curtains.

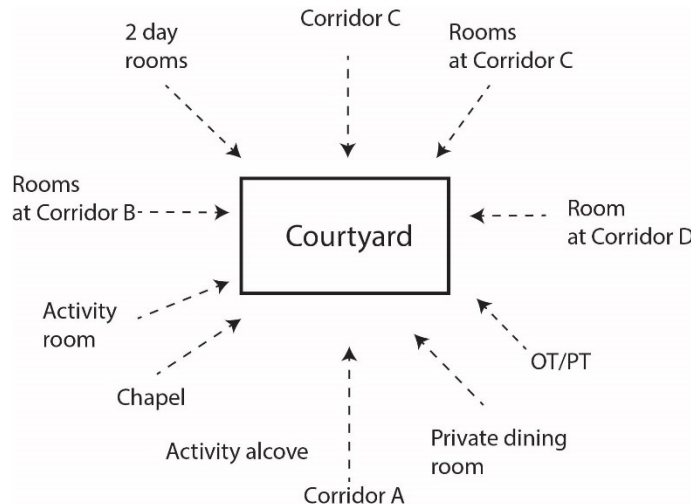


Figure 5-1. Indoor spaces with visual access to the courtyard at Silver Life

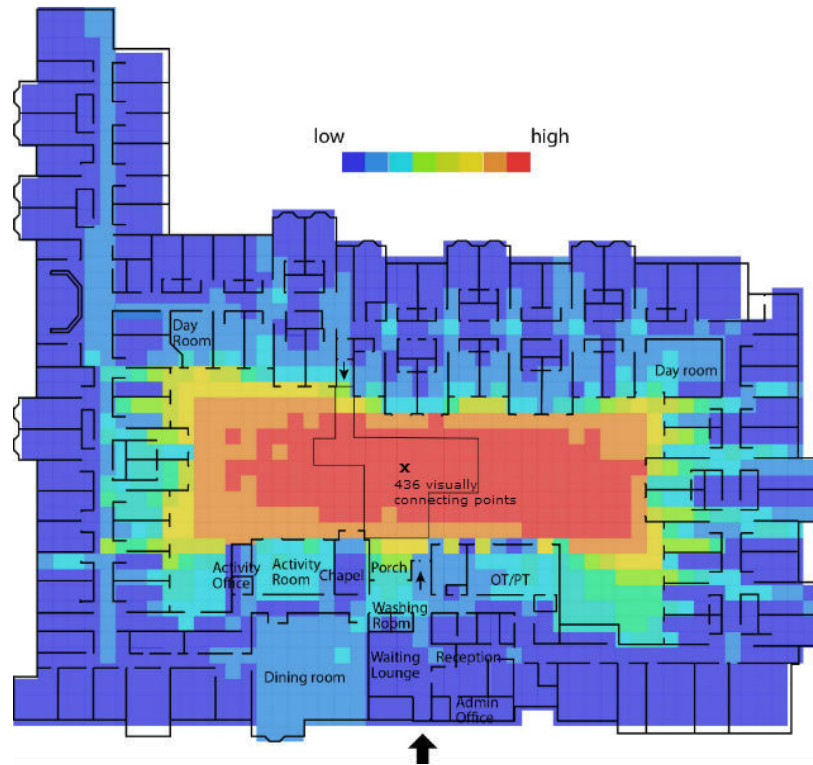


Figure 5-2. Visibility analysis of the courtyard at Silver Life



Figure 5-3. Depth-path analysis of the courtyard at Silver Life

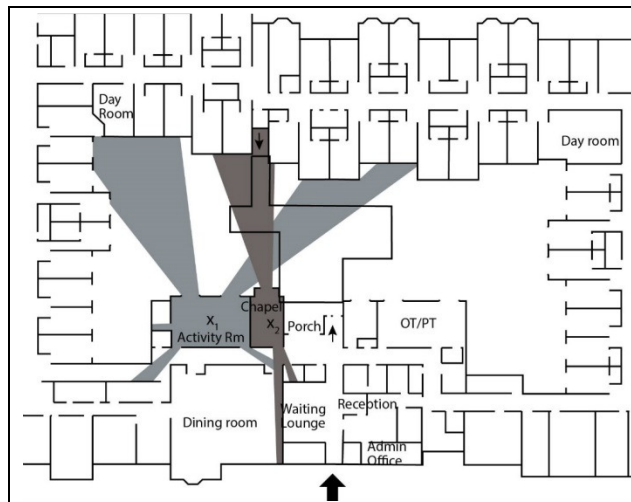


Figure 5-4. Isovist analysis from the activity room and chapel in Silver Life

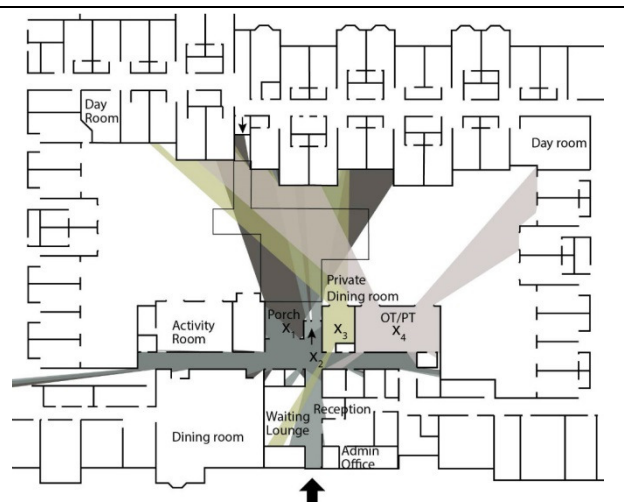


Figure 5-5. Isovist analysis from the entry at Corridor A, activity alcove, family private meeting/dining room and OT/PT room in Silver Life



Figure 5-6. Isovist analysis from two resident rooms at Corridor B looking at the courtyard of Silver Life

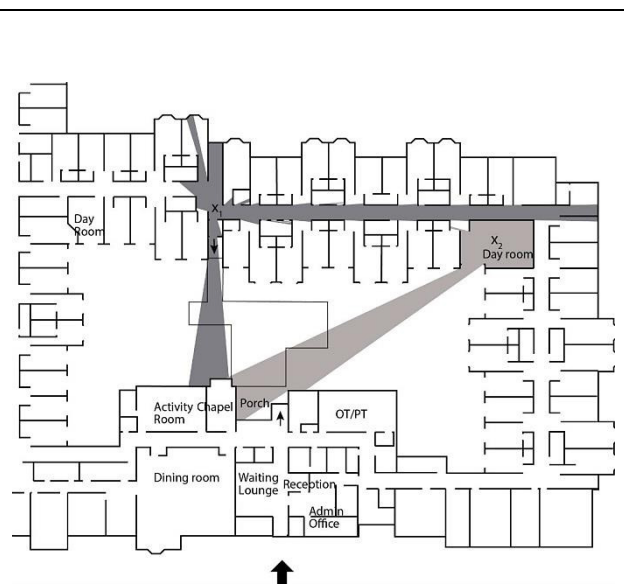
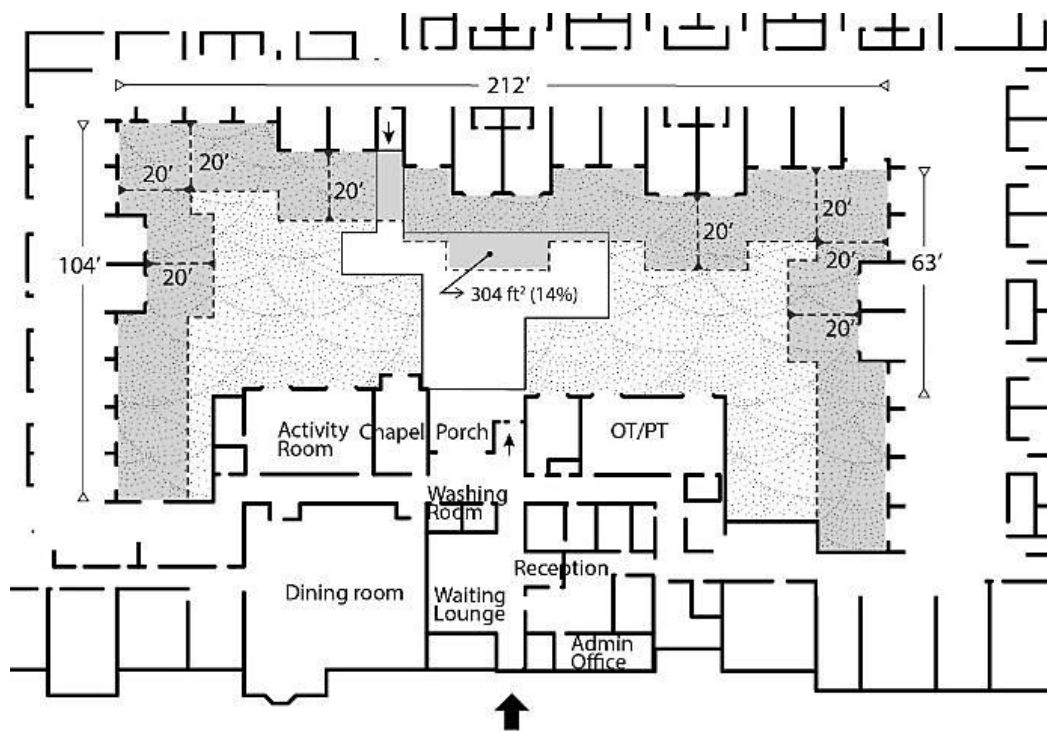
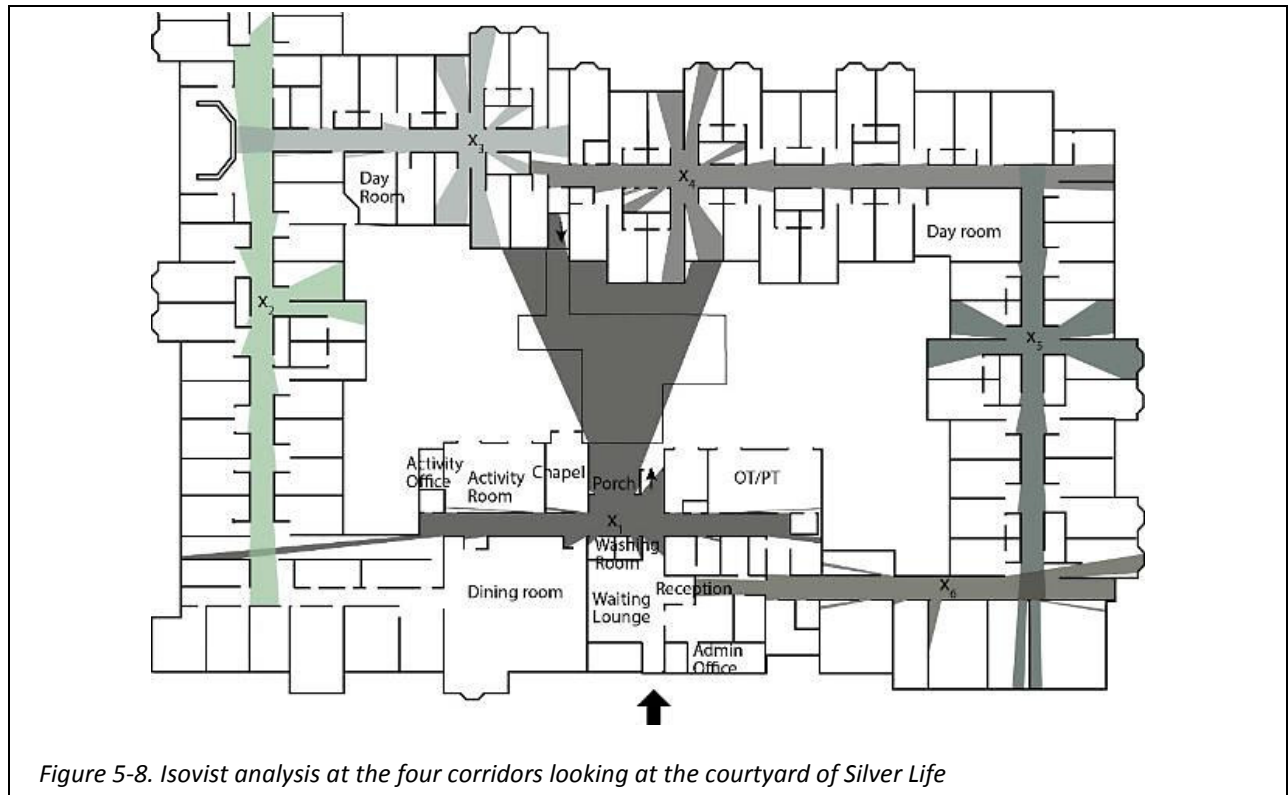


Figure 5-7. Isovist analysis from the entry at Corridor C, and day room looking at the courtyard of Silver Life



2) *Spatial arrangement*

▪ ***Layout***

The layout of the courtyard is characterized by a patio sandwiched in between two pieces of grass areas (Figure 5-10). The layout confines all people and their activities within the central patio, which makes monitoring easier. When the weather is permitting, the central patio serving as a shortcut (100 feet) connecting Corridor A and C. Staff like to use the shortcut. Natural surveillance is carried out when staff pass the courtyard. During the observation period (June, 2013), at least two staff members were found in the courtyard in every 20 minutes between 11:00am to 2:00pm in general. On the one hand, this frequency of staff visit may ensure safety. On the other hand, it may make courtyard users feel being constantly monitored or being forced to socialize with others.

There are some disadvantages by making the main activity patio at the center of the courtyard. First, because it serves as a path and an activity area at the same time, behavior conflict may be created between users with different purposes. Although the courtyard has a generous size, there is no alternative path or activity section. Second, the patio is paved with the same concrete slabs and has no clearly-defined sections. No paving patterns help distinguish gathering space from walkways.

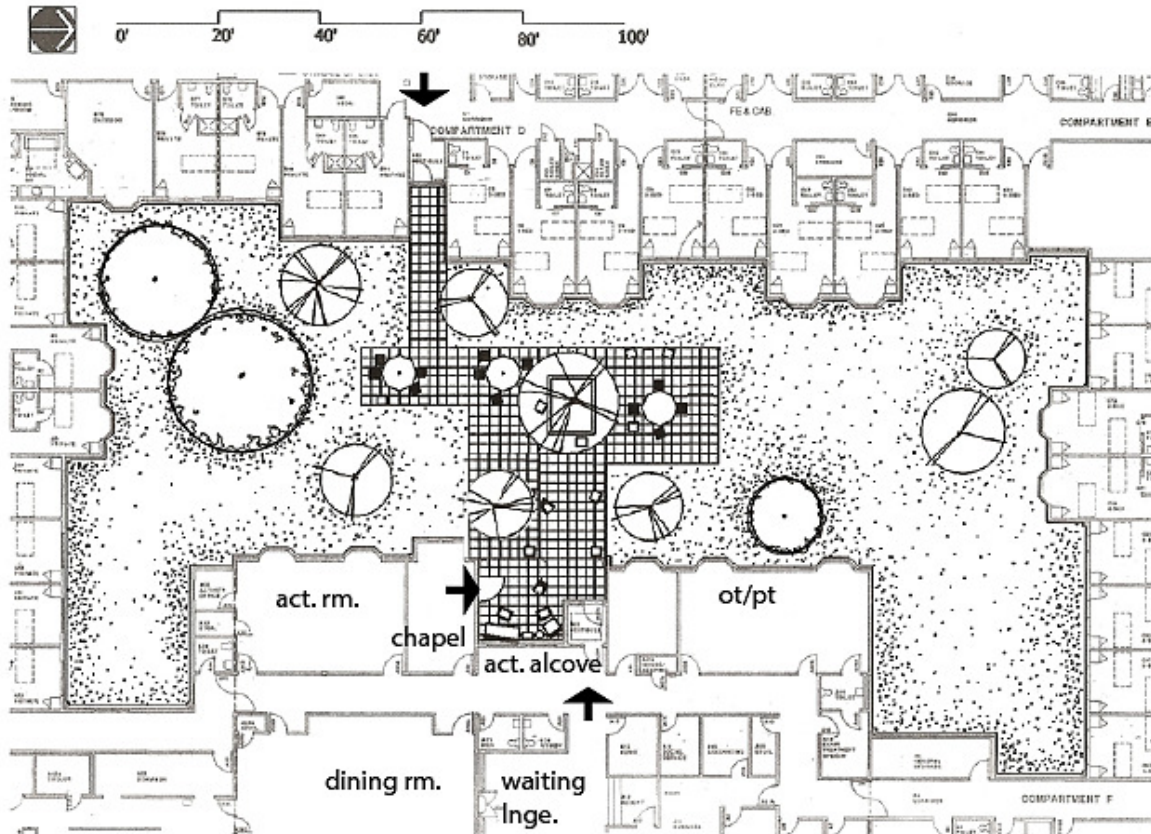


Figure 5-10. Layout of the courtyard at Silver Life

▪ **Exit/Entry**

There are two major exits/entries. One entry vestibule is located at Corridor A and the other at Corridor C. The two entries are used by most of residents due to their locations and easy access. The third entry covered by the porch roof is located at the chapel. It is not apparent and used mostly by staff. According to the observation, residents were able to leave by the same door they enter; they hardly missed the exits or felt disorientation.

▪ **Spatial variety**

The courtyard is characterized by a variety of seating space. There are several shaded seats under birch trees, umbrella tables and a tent (Figure 5-11). The roofed porch serves as a transitional

area between indoor and outdoor space, allowing eye adjustment of daylight and offering an area for people who like to sit near the entrance (Figure 5-12). The patio accommodates group gatherings but lacks two-person seats with screening foliage. Residents can be easily observed, and their conversation can be simply overheard.

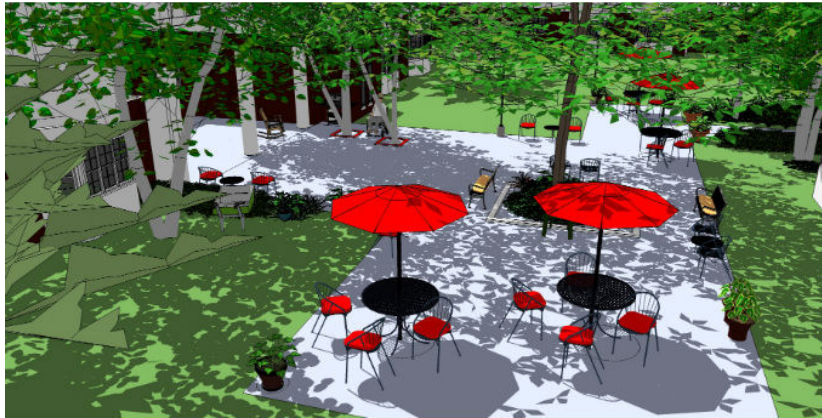


Figure 5-11. Simulating the central patio of the courtyard at Silver Life with sunlight at 10:00 am



Figure 5-12. Simulating the porch of the courtyard at Silver Life with sunlight at 3:00 pm

3) *Depth and density*

The courtyard meets a state-level requirement regarding clear open space in front of bedroom windows and the square footage per bed for outdoor space.

In terms of depth, the courtyard provides more than 60 feet deep outdoor space for bedroom windows at Corridor C and 200 feet deep for those at Corridor B and D. Although Wisconsin has no requirement regarding this, other states like Minnesota and Alabama specify the depth. They require a minimum of 20 feet of open space in front of bedroom windows. Silver Life's courtyard exceeds that standard.

The courtyard is approximately 15,720 square feet including 330-square-foot porch space, 2,170-square-foot patio space, and 13,220-square-foot lawn areas. Besides the courtyard (the enclosed outdoor space), the facility has open outdoor areas adjacent to the building. The open outdoor space is 38,148 square feet. Overall outdoor areas ensure 489.7 square feet per bed for outdoor space, 143 square feet per bed for secured outdoor space (courtyard) and 22.7 square feet per bed for activity (patio and porch) space (Table 5-5). Not many states give specific density requirement of outdoor spaces. For example, Wisconsin requires period-C facility (plans approved after 1974) to have a minimum of 15 square feet per resident bed for outdoor recreation areas, exclusive of driveway and parking area; however, definitions of "outdoor recreation areas" are not provided. It is unclear to know whether they include lawn/landscaped space or is limited to paved space.

Similarly, Massachusetts required at least 25 square feet per bed for outdoor recreational areas and in 2014, the state started to demand that the outdoor space should be secured. Connecticut provides the most specific descriptions of outdoor space. The state requires 10 square feet per resident bed for outdoor porches or paved patio areas, and a minimum of 100 square feet per resident bed for overall open outdoor area. Since most of nursing home residents are wheelchair users, it seems more reasonable to specify a minimum of square footage for paved activity space. As shown in Table 5-5,

Silver Life provides more outdoor space than requirements defined by Wisconsin, Connecticut and Massachusetts.

In Silver Life, although a great amount of adjacent outdoor space and attached nature preserve, residents are not encouraged to use those areas. The courtyard is the only space that allows spontaneous visits; therefore it is more meaningful to understand square footage in use of the courtyard space. The number was learned through counting actual space usage. During the observation period, an average of 5.43 residents and a maximum of 20 residents were found per half-hour snapshot observation. Each outdoor user at peak hours shares approximately 434-square-foot courtyard space and 125-square-foot paved areas. Each person on average has 2,731-square-foot courtyard space and 786-square-foot paved areas. Therefore, crowdedness is not a problem here.

Table 5-5. Comparison of Silver Life's square footage per bed for outdoor space with state-level requirements

Density \ Area		Silver Life	Wisconsin	Massachusetts	Connecticut
Outdoor density	Square footage per bed for overall outdoor space	489.7	15	n/a	100
	Square footage per bed for courtyard space or other enclosed outdoor space	143	n/a	25	n/a
	Square footage per bed for activity (patio) space	22.7	n/a	n/a	10
Avg. density in use of the courtyard*	Square footage per person for overall courtyard	2731	n/a	n/a	n/a
	Square footage per person for activity (patio) area	786	n/a	n/a	n/a
Max. density in use of the courtyard**	Square footage per person for overall courtyard	434	n/a	n/a	n/a
	Square footage per person for activity (patio) area	125	n/a	n/a	n/a

*Space divided by **Avg. # of person** per half-hour interval snapshot-observation

Space divided by **Max. # of person in a half-hour interval snapshot-observation

2. Sensory properties

Sensory properties are analyzed from five perspectives: 1) color selection, 2) sound levels, 3) material with tactile quality, 4) olfactory resources and 5) garden-grown food. They describe major features that induce five-sensory experience. Overall, the courtyard is rich in color but lacks resources of triggering olfactory and taste experience.

1) Color selection

Digital images

Twelve pictures were selected for color analysis (Figure 5-13). Photos with a close-up shot (e.g., Image C, D, and F) captured objects with outstanding colors. Photos with a medium or long shot (e.g., Image B, E, I) captured a full view of the courtyard setting. They illustrated overall color distribution of the courtyard. Among these pictures, the red umbrellas are definitely striking elements. The blue sky overshadows other colorful objects. With the direct sunlight, building and paving materials lighted up the courtyard due to their higher reflection rate (e.g., Image E & K). Shadows of trees or structures darkened parts of the area and increased color/luminous contrast.



Figure 5-13. Twelve selected images for color analysis of the courtyard at Silver Life

Results of color analysis

Results of HSB analysis from ImageJ and the Image Color Summarizer are shown in Table 5-6.

Overall, the courtyard is not monochromatic. Different colors are added to enrich green lawns and sandy-brown walls. These colors are not dreary; furniture and blue sky bring vividness to viewers. Architectural materials show a high value of brightness under the direct sunlight, suggesting a high possibility of glaring.

Specifically, the hue histograms of the selected images suggest that the courtyard contains red, orange, yellow, lime, green, blue and purple. A higher number of pixels are found to be associated with these colors. Three representative colors of the courtyard are green, lime and yellow. An average hue value of the 12 images ranges from 31 (orange) to 111 (green). Most of the images have a mean value of hue as green, lime and orange-yellow. Since these images show skewed distribution, it is also important to understand their median hue. Five images have a medium hue in yellow, four images in lime and two images in green. Based on their color 3D models, the color in the range of yellow is derived from architecture façade, concrete pavement and vegetation, and green and lime originate from vegetation.

The minimum value of hue is 0 (red) and the maximum value is 360 (red) among the 12 photos. Umbrella tables and flowers are major sources of red.

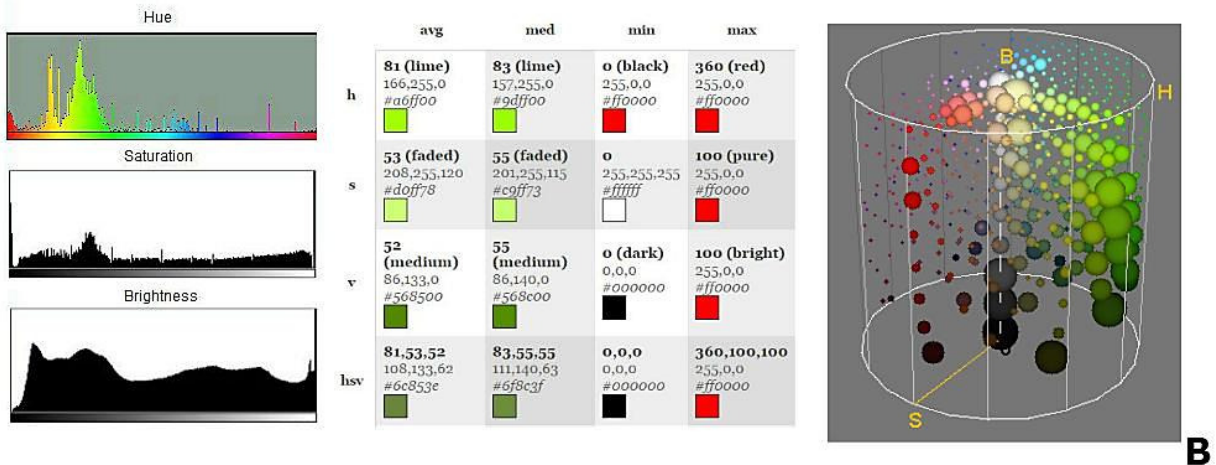
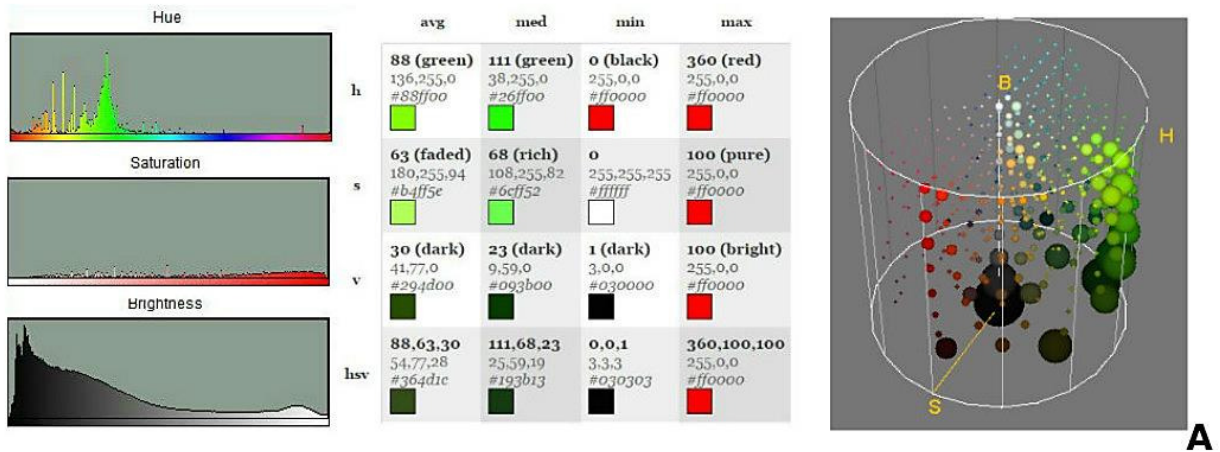
Eleven images have a mean value of saturation as “faded” and seven images have a medium saturation as “faded”. In some pictures, images of umbrellas and sky creates pure red or blue (100% intensity). These elements bring vividness into the courtyard. On average, most of the images show a medium level of brightness, suggesting most of pictures are in low contrast. Some pictures contain a minimum of brightness (value =0), which may cause from shadows of objects.

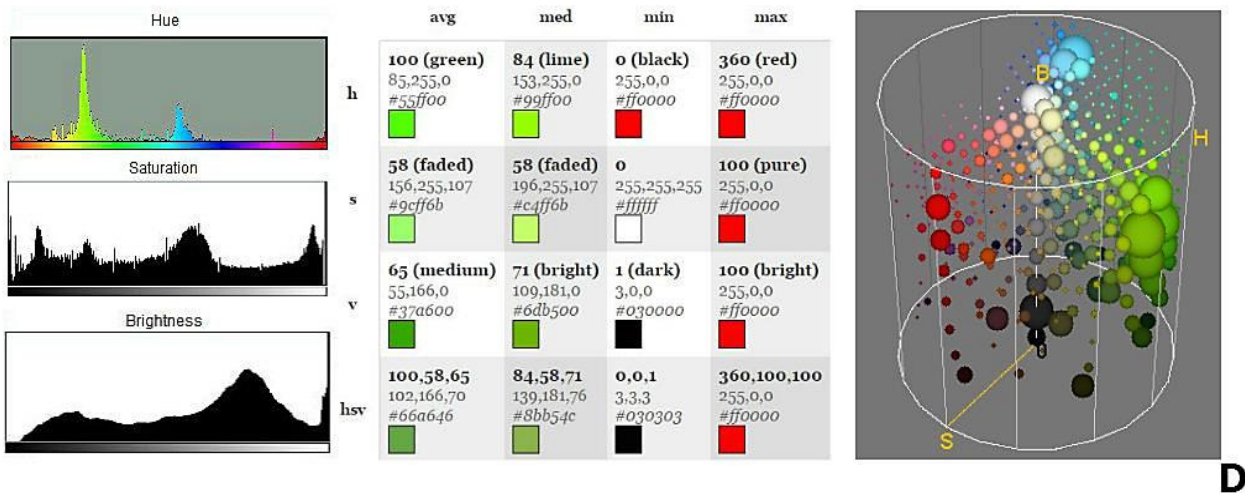
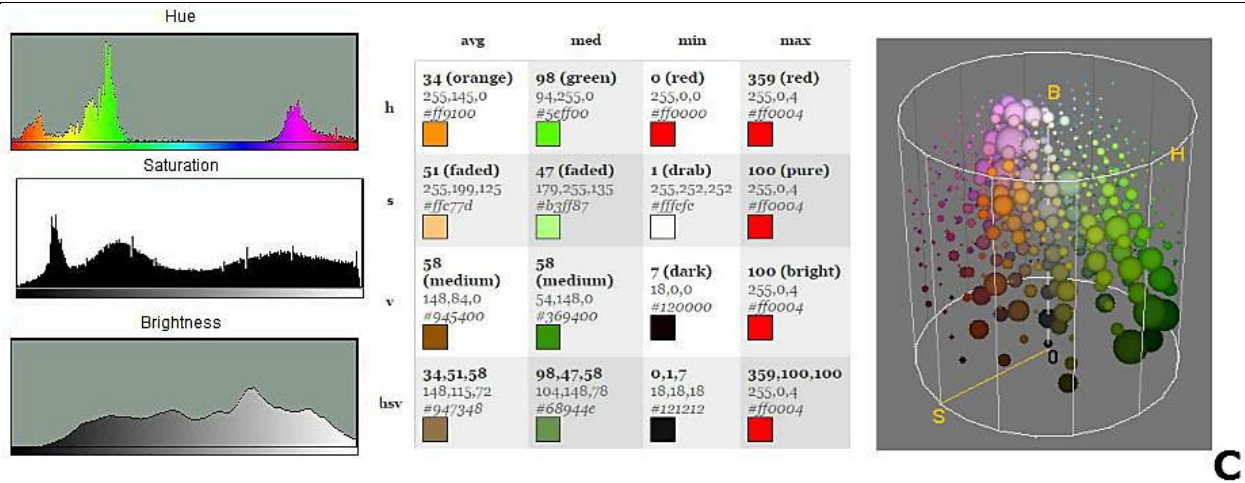
The HSB 3D graphics help visualize courtyard’s color palette in a cylindrical geometry. Overall, hue angles in most of the image are between 0° and 180°. Colors stay around the middle of the brightness axle with different levels of saturation. Green (e.g., 90°, 76%, 62%) is a major color with

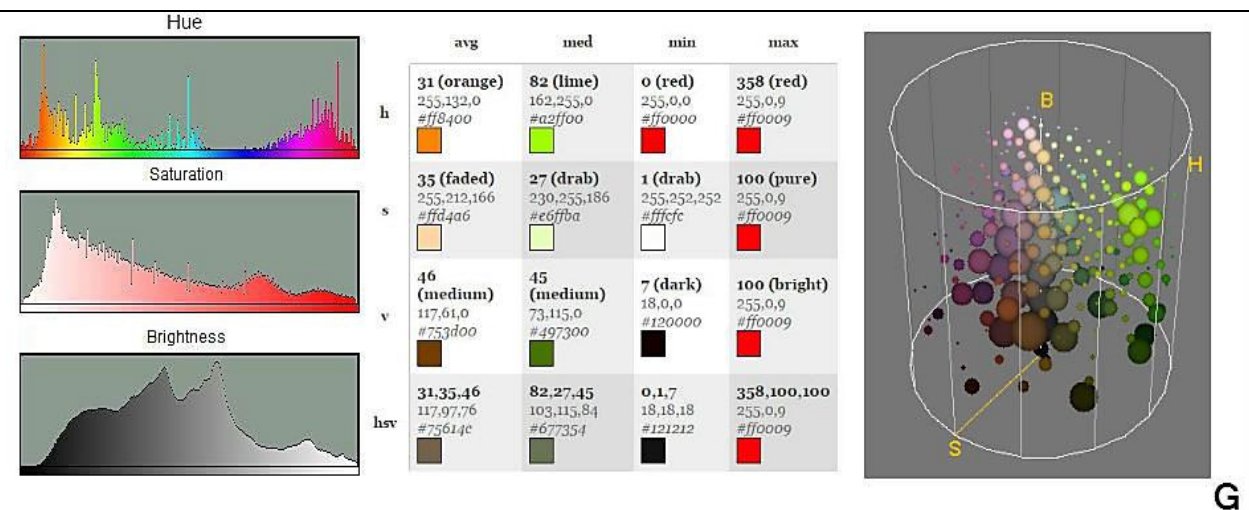
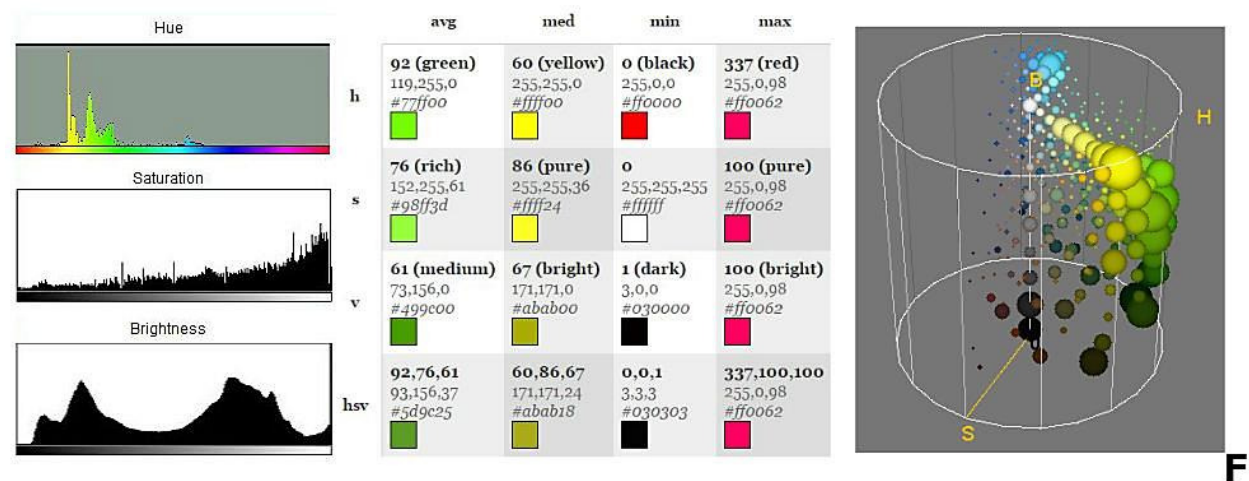
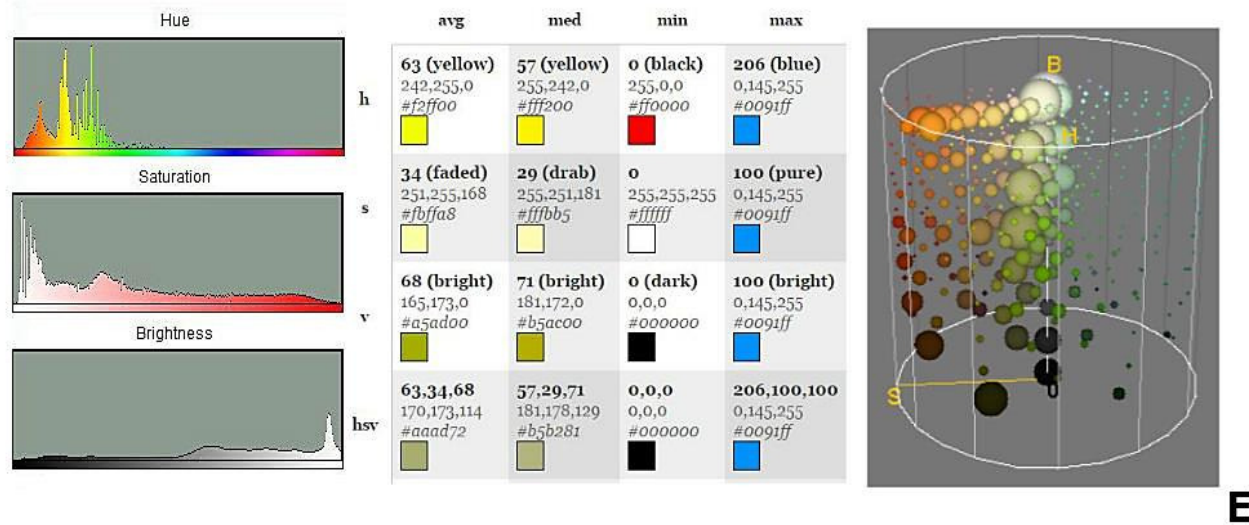
higher frequency (larger dots), higher saturation (close to circle edges) and medium to dark brightness.

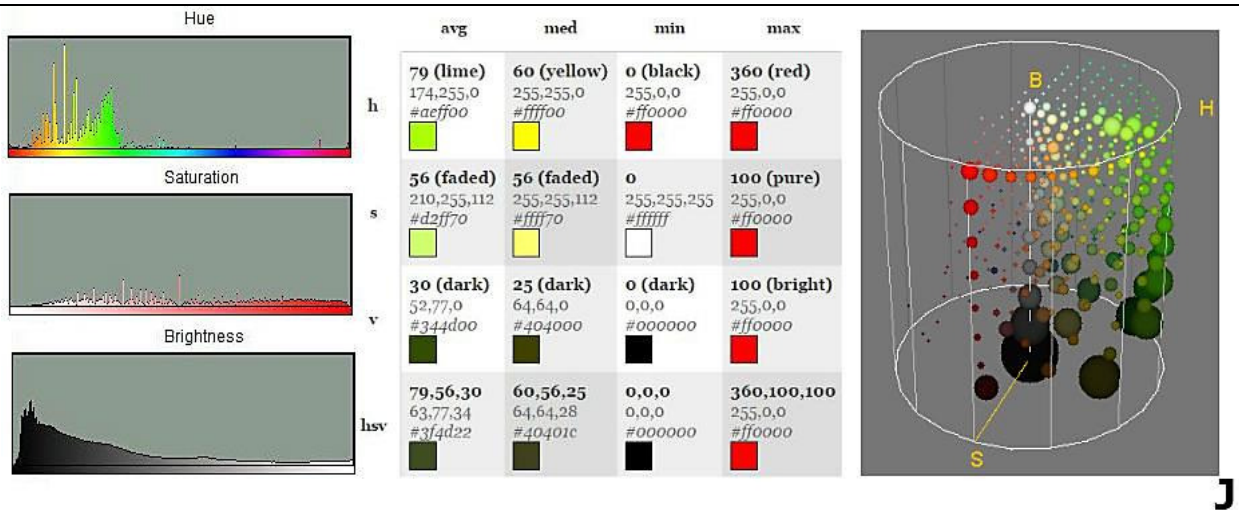
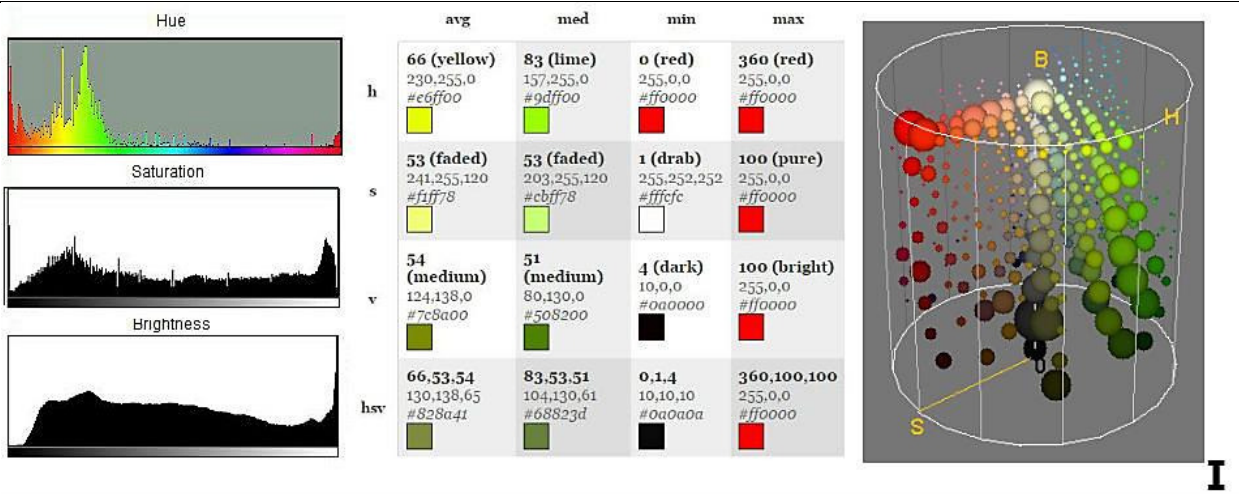
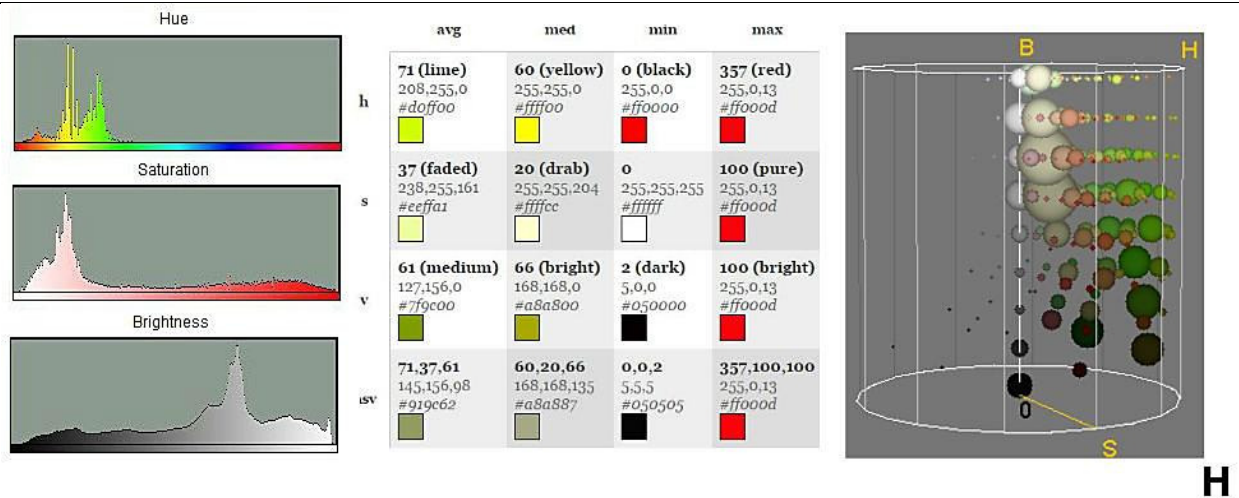
Architectural façade and concrete pavement (Table 5-6, Image E) show colors of sandy brown (36°, 60%, 97%) and white (0°, 0%, 97%). Their color balls pile up at the top area of the central axis, suggesting a very high percentage of brightness. The excessive levels may suggest glare and uncomfortable reflections.

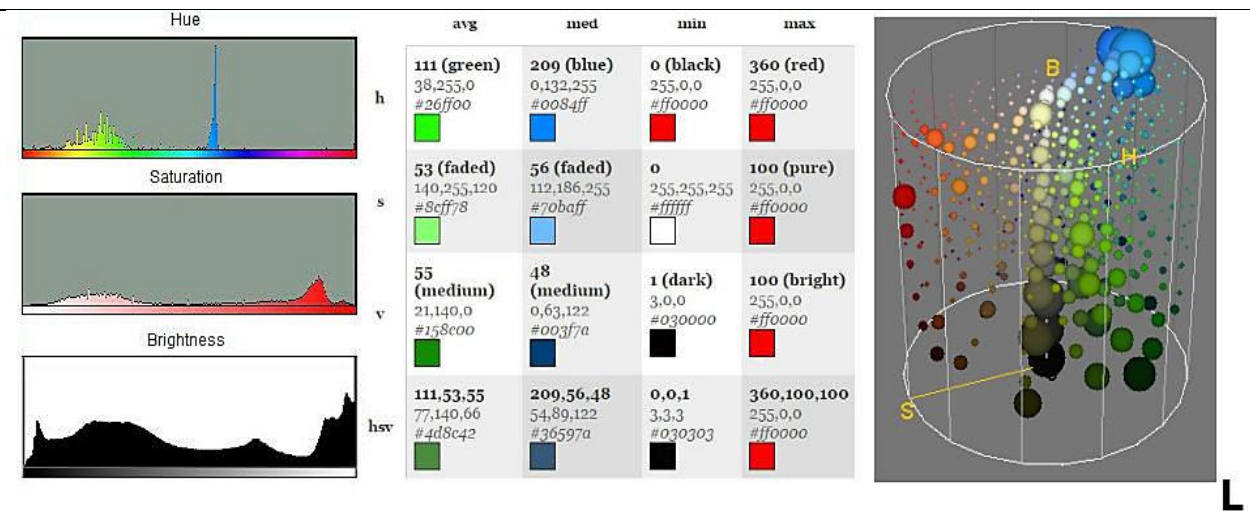
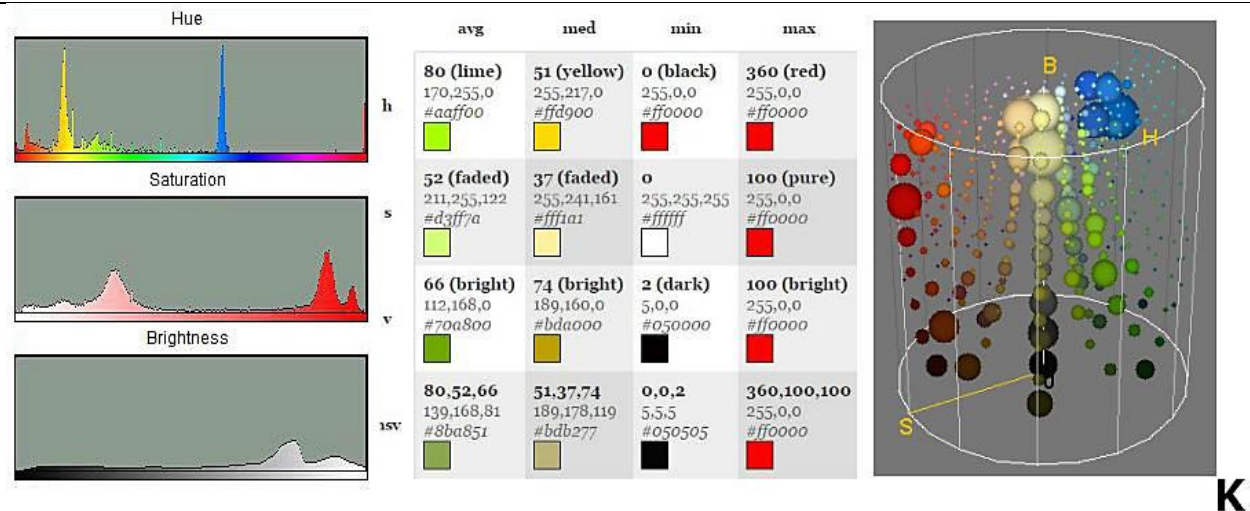
Table 5-6. Results of color analysis of the courtyard at Silver Life











2) Level of sounds

The courtyard of Silver Life is serene in general. Its sound levels were measured every half hour at the center of the patio during the seven observation days. Total 57 records were created.

According to the data, an average sound level of the courtyard is 56.43 ± 4.56 dB with a range between 49 dB and 80 dB. The maximum value was produced by the acoustic audio equipment playing music for three hours. A mean value of the sound levels exclusive of the music goes down to $52.59 \pm$

2.65 dB. Ventilation and machine rarely produced noticeable noise; traffic caused little disturbance. The sounds of talking and cart-pushing were the most common background noise.

According to the noise standards defined by National Institute on Deafness and Other Communication Disorder (NIDCD)(NIDCD, n.d.), the courtyard in Silver Life is a quiet place on average (Table 5-7). NIDCD defines that a setting with less than 60 dB is like a quiet office providing comfortable hearing experience. The acoustic audio created 80-dB music. Such environment, from NIDCD's perspective, is annoying and may interfere with conversation (people have to speak very loudly). Long-term exposure over 80-dB sounds may cause hearing damage (Nelson et al., 2005; The National Institute for Occupational Safety and Health (NIOSH), 1998).

Table 5-7. Comparison of Silver Life's sound levels with different criteria defining "quietness"

	Silver Life's courtyard	NIDCD's standard	EPA's recommendation
Level of sounds (dB)	52.59 ± 2.65	<60	<55

The Environmental Protective Agency (EPA) requires that outdoor space of residential and hospital areas should not exceed 55 dB (EPA, 1974). In this regard, Silver Life's courtyard quite meets the limit.

It is hard to decide that the courtyard was quieter than indoors settings since the indoor sound levels were not measured; however, the existing studies may help picture indoor auditory stimulation. Joose (2011) surveyed noise pollution of four non-for-profit metropolitan nursing homes in Wisconsin. These facilities have a sound level over 54-dB⁵ on average. Bedroom areas are the quietest space (51.48± 6.88 dB), much quieter than dining space (60.43± 4.14 dB) and common areas (58.99± 4.27 dB). Based on the EPA's recommendation, these nursing homes provide no comfortable auditory environments, and may affect health. Similarly, Bharathan et al (2007) found that an average indoor

⁵ According to Joose (2011), the four facilities on average have 52.91 dB before breakfast, 56.93 dB during breakfast, 57.65 dB after breakfast, 58.68 dB after lunch, 54.43 dB mid-afternoon, 57.24 dB before supper, 59.46 dB during supper, and 58.90 dB after supper.

sound level of a nursing home is 57.3 ± 2.1 dB. Resident rooms are supposed to be quiet but in this case, they are noisy (56.5 ± 1.9 dB). In that sense, Silver Life's courtyard may provide tranquilization.

3) Material with tactile quality of surface:

In the courtyard, sources of tactile stimulation include 1) natural materials with different texture, 2) winds triggering senses of pressure and 3) the outdoor temperature inducing senses of heat or coldness. During the observation period, some plants produced interesting tactile experiences. The wind occasionally induced noticeable senses of pressure. The weather was hot in general, disallowing long outdoor stay.

Natural materials

In the courtyard, the skin of paper birch trees flakes off in patches, providing rugged texture. Vegetables also work well in this regard. In 2012, there were two vegetables boxes at the courtyard. Residents were able to weed and pick up tomatoes and carrots. In 2013, vegetable boxes were replaced with several round containers. Only tomato and chive plants were preserved. Spontaneous gardening continues. Residents gently flipped hairy leaves and stems of tomato plants to check their ripeness. They touched and picked up chives to experience spicy onion smell.

Wind

A wind speed suggests a degree of pressure, which is related to experiences of touch and associated with human comfort. The Beaufort scale (Table 5-8) helps transform wind speeds into levels of human comfort. Wind speeds at the central patio were measured using the handheld travel anemometer. They were sampled every half hour at the central patio during the seven-day observation. A total of 77 records were created. An average wind speed is 2.97 ± 2.07 mph with a range between 0 and 8.3 mph (Table 5-9). Overall, the courtyard based on the Beaufort criteria can be described as "calm" or "light-air". There were five days that the courtyard had no noticeable wind with

an average wind speed less than four mph. The other two days had occasional “gentle breeze” with wind speeds over seven mph.

Table 5-8. Beaufort’s criterion of wind. Modified from Sanz-Andres & Cuerva (2006)

Beaufort number	General description	Speed (mph)	Descriptions of wind effects on people
0	Calm	<1	Calm, no noticeable wind
1	Light air	1-3	Calm, no noticeable wind
2	Light breeze	4-7	Wind felt on face
3	Gentle breeze	8-12	Wind extends light flag; newspaper reading becomes difficult. Hair is disturbed. Clothing flaps.
4	Moderate breeze	13-18	Raises dust, dry soil and loose paper. Hair disarranged.
5	Fresh breeze	19-24	Force of wind felt on body. Drifting snow becomes airborne. Limit of agreeable wind on land.

Table 5-9. Wind speed at the courtyard of Silver Life (mph)

	3-Jul	4-Jul	6-Jul	8-Jul	9-Jul	10-Jul	11-Jul	
Max	6.9	4.8	6.8	6	8.3	5.2	4.4	Max=8.3; Min=4.4; Avg = 6.06
Min	0	0.2	1	1.9	0.8	0.4	0	Max=1.9; Min=0; Avg = 0.61
Avg	2.28	2.38	3.58	4.24	4.85	2.49	1.17	Overall average: 2.97±2.07

Temperature

According to the National Weather Service (NWS), the air temperature during the observation period (between 10: 00 and 5:00 pm from June 3 to 11, 2013) is shown in Table 5-10.

Table 5-10. Air temperature between July 3rd and 11th , 2013 (°F)

	3-Jul	4-Jul	6-Jul	8-Jul	9-Jul	10-Jul	11-Jul	
Max.	64	78	80	82	80	75	75	Max=82 ;Min=64; Avg = 76.3
Min.	57	55	60	68	72	68	65	Max=72; Min=55; Avg=63.6
Avg.	63	74.8	79.3	77.5	73.6	73	74.1	Overall average: 73.6

These values provided by NWS are measured with several conditions. For example, thermometers are placed five feet above the ground, under the shade and with good air flow. The reported numbers may

differ from what people feel in a specific setting. A spot in the sun will be warmer than that under a tree or building shade. Concrete and pavement may retain more heat than grass due to solar radiation.

Two outdoor digital thermometers were used to collect temperature data at the central patio of the courtyard. The temperature was measured every half hour from 10:00 am to 5:00 pm during the five-day observation (July 3, July 4, July 6, July 8, July 9, July 10 and July 11). Overall temperature data is summarized in Table 5-11.

Table 5-11. Temperature measured at the courtyard of Silver Life

	3-Jul		4-Jul		6-Jul		8-Jul		9-Jul		10-Jul		11-Jul			
	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun
Max	76.1	88	77	89	79	93	82	96	85	90	81.9	92.3	92	99.5	Max=92	Max=99.5
															Avg = 81.9	Avg = 92.5
Min	64	84	71	80	69.9	77	68.4	79	76.5	88.4	69.5	80	71	87	Min=64	Min=77
															Avg = 70	Avg = 82.3
Avg	71.5	86	74	86	76	85	76	85	79.9	89.8	78	87.5	82.1	91.2	Overall Avg =77.1	Overall Avg =87

The temperature measured in the courtyard is higher than the air temperature. Several reasons may cause the difference. First, solar energy is radiated from building material and hard pavement, making the courtyard warmer than expected. Second, the meter in full sunlight is sun-soaked and therefore reads a high number (Williams, 2006). Overall, the average temperature in the shade was between 70 and 80 degree and that in the sun fell between 82 and 92 degree. The highest temperature measured was 99.5 at 2:00 pm on July 11, 2013. In general, there was 10 to 15 degree difference between temperature in the sun and in the shade. The difference is consistent with some meteorological findings (Hessong, n.d.; Ling, 2011; Williams, 2006).

In terms of levels of indoor thermal comfort, Wisconsin requires that a nursing home should maintain a minimum temperature of 72 °F during the day and at least 70 °F during the night in all bedrooms and in all other areas used by residents. No maximum temperature is specified. Arizona

requires that the temperature in nursing homes is no less than 71 °F or more than 84 °F. Arkansas gives more specific descriptions of the indoor and outdoor temperature: “The institution shall be equipped with heating and cooling equipment that will maintain a minimum temperature of seventy-five (75) degrees F during winter and eighty (80) degrees F during summer in all patient areas when the temperature outside does not exceed ninety-five (95) degrees F. If temperature outside exceeds one-hundred (100) degrees F, there shall be a fifteen (15) degree F difference in exterior to interior temperature.” These standards suggest a comfortable range of temperature (71 to 84 °F) for nursing home residents. Based on these criteria, residents who prefer a warmer temperature may still feel comfortable to stay at outside in the shade (Table 5-12). However, staying in the sun for too long may increase a risk of dehydration and other heat-related illnesses.

Table 5-12. Comparison of Silver Life’s courtyard temperature with state-level requirement of thermal comfort

	Average temperature measured at Silver Life’s courtyard		Wisconsin	Arizona	Arkansas
	shade	sun			
Temperature (°F)	77.1	87	72 (Min.)	71 (Min.) 84 (Max.)	75 (Min.) in winter 80 (Max.) in summer

4) Olfactory resource and garden-grown food

Sources of olfactory and taste stimulation in the courtyard include flowering plants, herbs and vegetables. However, they were not always available. Availability decided by whether there is a continuous maintenance effort.

In the courtyard, lilac bushes gave strong fragrance. They were maintained by staff. Wild moonflowers, according to a resident, were a surprise in the courtyard one year before the study (2012). They bloomed at night with blue flowers and sweet aroma, which quickly became topics of conversation; however, the resident shown worries of the plant dying in winter. During the observation period (2013),

chive plants and cherry tomatoes provided olfactory and taste stimulation. Garden carrots were the highlight in the past but they were discontinued in the courtyard.

3. Building-system properties: built & human-made features

Built and human-made features of the courtyard can be categorized as 1) wheelchair-friendly design, 2) weather protection, 3) sitting furniture, 4) animal and plant supplies and 5) cultural symbols (Table 5-13). These features shape the courtyard in a way that highlights many experiential qualities.

Two major wheelchair-friendly features are automatic doors and one-level concrete paths. All entries/exits are installed with the automatic feature and a wheelchair opener. They allow effortless and independent access to the courtyard. Furthermore, there is sufficient maneuvering clearance for wheelchair turning. No threshold blocks the way in and out. One-level concrete surfaces extend from the east entry to the central patio and ends at the west entry. Although there are few cracks, wheelchair users can still travel between locations without problems.

The courtyard has some structures and shade devices. The porch is a transitional area allowing eye's adjustment to the sunlight. It is also a place allowing residents who have no desire to venture further to stay near the east entry. A tent extends from the porch to the center of the patio; it provides shade for courtyard users. Umbrella tables and a canopy of a huge honey locus also help cool air and sustain a longer social interaction.

The outdoor furniture in the courtyard is moveable. People are able to arrange chairs and coffee tables to meet their needs. For example, they created a group or two-person setting for better interactions. The change of environments, although temporary (i.e., a chair will be reorganized by maintenance staff next day), gave residents opportunities of personalizing a social setting and better weather adjustment.

Shepherd hooks and plant containers made flowers more visible. Birdfeeders were hung outside bedroom windows and in the tree. Over 20 bird feeders have attracted many birds to nest in the courtyard and caught residents' attention.

The courtyard has a wheelbarrow and wood wagon wheel to facilitate reminiscence. As commented by the activity director, "We reminisced when we stay in the courtyard. We talked about their background and history of growing upon the farm. It is very common they have victory gardens or have a small garden for themselves." However, these artifacts were either covered by plants or placed in a less visible spot, which to some extent reduces its function of serving as a visual prompt.

Table 5-13. Building systems: built & human-made elements of the courtyard at Silver Life

Category		Description	Purpose
Wheelchair friendly feature	Wheelchair accessible door with an automatic push pad	Being installed at the east and west entrance	<ul style="list-style-type: none"> • Providing easy access
	Concrete pavement		
Weather protection	Porch	A transitional area between indoor and outdoor space	<ul style="list-style-type: none"> • Providing protection from the weather • Allowing residents to adapt to lighter environments • Allowing weather adjustment
	Tent	Extending from the east entrance to the center of the patio	
	Three movable aluminum mesh umbrella tables		
Sitting furniture		Three movable aluminum mesh umbrella tables, eight mesh chair, three plastic chairs, two rocking chairs, one double and single wicker chair, one wicker table and one cabinet	<ul style="list-style-type: none"> • Providing seating space for ambulatory residents and family members • Giving flexibility to arrange the furniture based on the need of activities • Giving cues of past activities
	Outdoor furniture		
Animal and animal supplies	Bird bath		<ul style="list-style-type: none"> • Increasing wildlife interest
	bird feeders Shepherd hooks Container/Planter	Steel hooks for hanging planters and bird feeders	<ul style="list-style-type: none"> • Making plants more visible by adding vertical variation to the courtyard
Cultural symbol	Memory prompt	Flag, wheelbarrow and wood wheel	<ul style="list-style-type: none"> • Serving as cues of past life • Triggering topics of conversation
Communication device	n/a	n/a	n/a
Water feature	n/a	n/a	n/a

C. Support of experience attributes

The courtyard was evaluated by the activity director and researcher using Courtyard Audit Tool for Physical Settings (Appendix G). Results are illustrated in Figure 5-14.

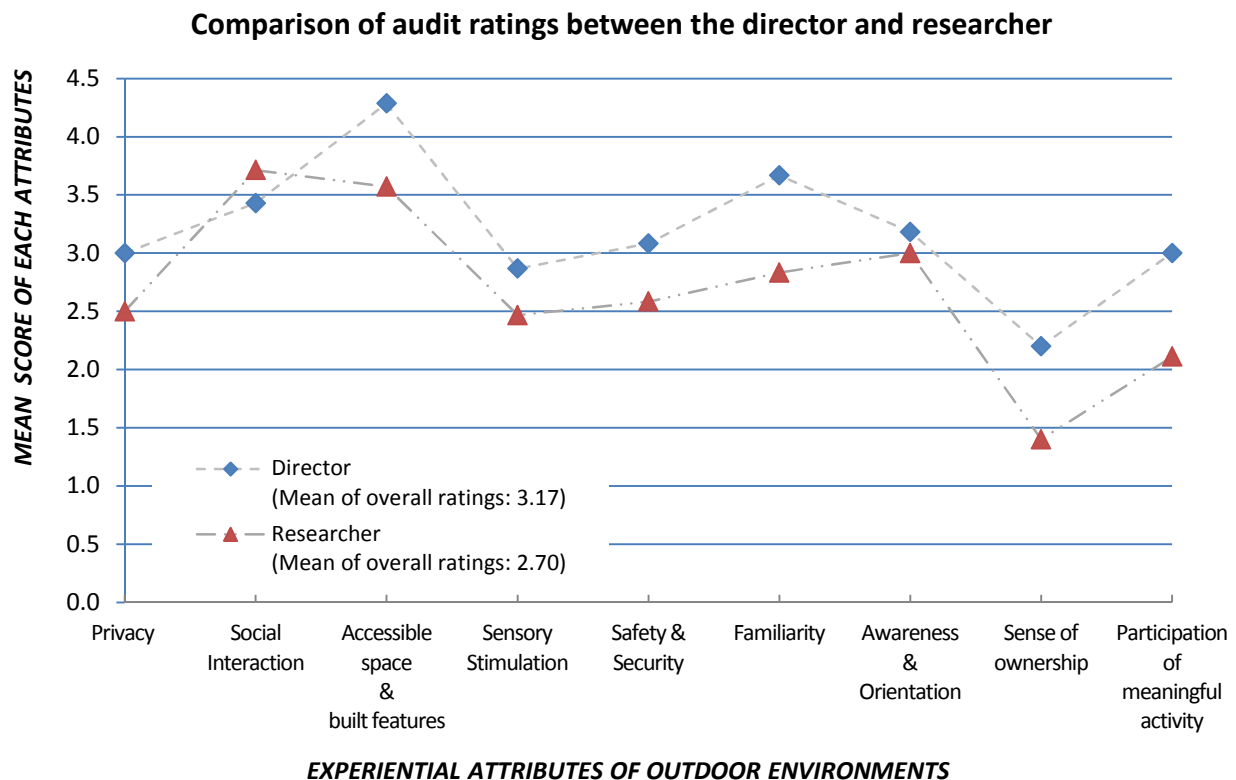


Figure 5-14. Scores of physical settings of Silver Life

From the director's perspective, the courtyard addresses resident needs of accessibility, socialization, and senses of "home" but lacks five-sense experiences. According to her, an ideal courtyard should provide gardening activities and allow residents to share results of garden works because these activities would enhance a past social role.

“Safety & security” is not quite supported by the physical settings from the director’s perspective. There is no visual access from the activity office and no emergency communication. Residents are unable to contact indoor staff from the courtyard.

From the researcher’s perspective, many forms of social interaction are well promoted and accommodated by the courtyard. Spontaneous group gathering particularly animate the whole environments.

Consensus between the raters

Based on the both evaluations, “Accessible space and built features” are well achieved in the courtyard. Wheelchair automatic doors and easy-navigation surfaces promote independence of outdoor use. However, such independence has conditions. It only allows access to what is prepared for residents. Residents’ autonomy in terms of controlling “what, when, where and how I want” in the courtyard is not encouraged. For example, there is no water dispenser in the courtyard. To get water, residents have to ask staff to deliver the water. Many factors may shape the scheme of “semi-independence”. For example, to prevent from falling, the organization may provide passive outdoor activities that require little body motion and movement.

III. Courtyard at Golden Age

A. Overview of facility building

Golden Age is located in a neighborhood at the north of City of Milwaukee (12 miles from downtown Milwaukee). It stands at the border of the two census tracts of the neighborhood, which are characterized by 12 percent of population aged 65 and over, over 80 percent of African-American population. The median household income of the neighborhood is (\$34,589) lower than that of Wisconsin (\$ 52,627).

The facility opened in 1996. It is located in a residential area characterized by one unit, detached houses or two-story apartments. The facility building is a one-story brick structure covered with garble roofs. The building area has 27,000 square feet housing 81 certified beds. The facility is not very distinctive from background environments due to its subdued exterior made by tan brick walls and olive green roofs.

The architecture layout is formed by three parallel wings extending from circular double-loaded corridors (Figure T-1 in Appendix T). The layout was analyzed using NodeXL. Results are shown in a graph (Figure T-2 in Appendix T) and metric table (Table T-1 in Appendix T). These analyses suggest that Golden Age has 1) no transactional area between external and internal environments and 2) a centralized layout. These three features are described in Appendix T. In general, the access to resources (e.g., the courtyard) from resident corridors requires mental and physical efforts. One resident corridor is very isolated due to little spatial connectivity with other amenities.

B. Physical settings of courtyard space

The following section provides quantitative descriptions of spatial, sensory and building-system properties, and also reveals their supportiveness of the nine experiential attributes. Overall, Golden Age has simple but confused spatial properties. It lacks resources triggering multiple-sensory stimulation and is inadequate in furniture for social interactions.

1. Spatial properties

In general, the courtyard has very few visual and physical connections with indoor social space. Its spatial organization is simple with little spatial variety. In terms of size, the courtyard is too small to prevent a fishbowl effect or prevent from being observed.

1) Indoor-outdoor relations

▪ **Physical connection: geodesic and physical distance**

Golden Age's courtyard favors access from a residence corridor (Corridor C) and the dining/activity room. It has potential for serving as a shortcut between two corridors. In an ideal scenario, residents can stop by the courtyard on the way to returning to their rooms after a meal or activity; however, the door at the dining room to the courtyard is not wheelchair friendly; residents are forced to use indoor paths and miss opportunities of outdoor visits.

As shown in Table 5-14, the courtyard is located deep to the entry (four geodesic distances from the main entry); residents have to pass three places (the dining room, corridor A in front of staff offices and the living room) to get into the front patio. Such sequence aids in supervision; residents are very likely to be diverted to positive activities before eloping to home. The courtyard has the shortest geodesic and physical distance to Corridor C. Residents in the other corridors may experience much more difficulty in access to the courtyard.

Table 5-14. Distance between the courtyard and major indoor spaces in Golden Age

	Geodesic distance	Physical distance (ft.)
Main entry	4	107
Living room	3	90
Corridor A	2	47 to 127
Corridor B (residence)	3	99 to 163
Corridor C (residence)	2	43 to 80
Corridor D (residence)	3	100 to 147
Corridor E (residence)	3	83 to 120
Dining/activity room	1	adjacent
Second dining room	3	55
TV lounge	3	135
Nursing station	4	140

The dining room is the only social space with a direct outdoor access; the connection makes the dining/activity room as backup space for outdoor activities and allows the courtyard to serve as extension of indoor activity space. For example, staff had a barbecue in the courtyard on 4th of July in

2013; however, the weather was too hot for residents to join a cookout event so they let residents stay in the dining room. Residents were still able to observe the preparation process (e.g., cooking at the outdoors, staff running between the kitchen and the courtyard), enjoy the meal, and remain a sense of participation. When the weather was permitting in other days, indoor activities were planned at the courtyard. Residents who are sensitive to the light or wind stayed at the dining room observing outdoor scenes.

The second dining room at Corridor C does not earn such advantage since it only has visual access to the courtyard. Other social areas like the living room and TV lounge are located at the outer ring and are remote from the courtyard. The geodesic and physical distance create an obstacle to outdoor access and reduces awareness of on-going outdoor activities.

- ***Visual connection***

Golden Age's courtyard is highly visible from the resident rooms at the inner rings and the two dining rooms. However, its good visibility compromises privacy. Neither indoor residents nor courtyard users would feel being free from public attention due to a lack of visual buffer areas.

According to the floor plan, the patio can be observed from many indoor spaces (Figure 5-15) and from most of spots within the courtyard. Its visibility analysis confirms the observation, showing that the center of the courtyard is the most visible place with over 300 visually-connecting points (Figure 5-16). The entry of the dining/activity room is the most visible indoor space, followed by the dining room and intersection between corridors.

A depth-path analysis maps spaces with direct visual connection (Figure 5-17). Most of depth-one areas (space with direct visual link) are located at the inner ring. Once residents at the inner rings close their door and pull curtains, visual access from hallways to the courtyard is blocked; senses of confinement could be increased dramatically while walking through the buildings. In Golden Age's case,

a mixture of private and public space with outdoor views toward the courtyards may improve the confinement and increase orientation of time and seasons.

Based on isovist analyses from a specific point, people at the dining/activity room can observe the most courtyard space (Figure 5-18). Except the two dining rooms, no public areas are visually connected with the courtyard. The courtyard is partially visible from staff offices (Figure 5-19); staff would have to go outside to monitor different corners of the courtyard.

The bedrooms that surround the courtyard have outdoor scenes in sight (Figure 5-20). Residents in these bedrooms, on one hand, receive immediate outdoor stimulation and information; on the other hand, they can be easily disturbed by outdoor activities. People at corridors can hardly see the courtyard (Figure 5-21); their views are confined within the narrow hallways.

A privacy issue may be created by having too much visual access. In this case, a lack of visual screening and inadequate depth of the courtyard undermines privacy. As shown in Figure 5-22, the patio (activity) area is very close to bedroom windows; indoor residents may feel a lack of privacy and have to keep curtains closed. Because of the limited size, there is little flexibility for future improvement. If it is planted with 20-foot deep green buffer, only a small area (586 square feet, 27% of the original paved surface) is left for activities (Figure 5-22).

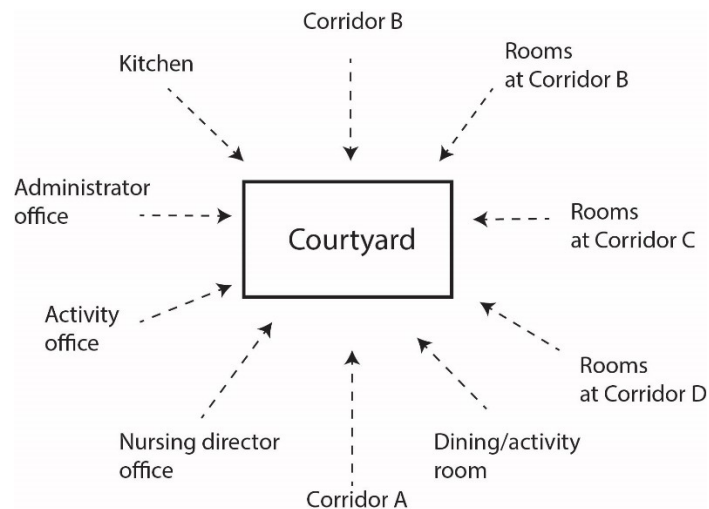


Figure 5-15. Indoor spaces with visual access to the courtyard at Golden Age

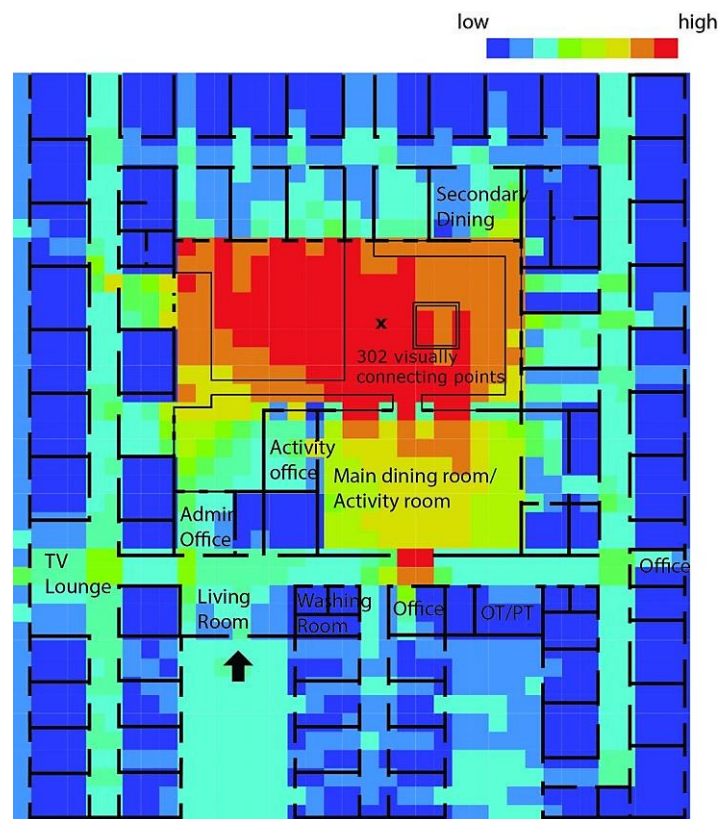


Figure 5-16. Visibility analysis of the courtyard at Golden Age

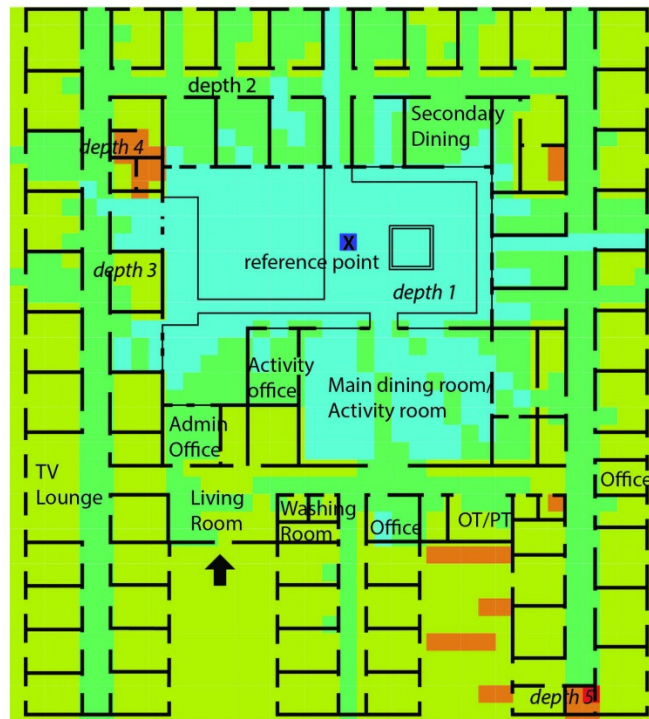


Figure 5-17. Depth-path analysis of the courtyard at Golden Age

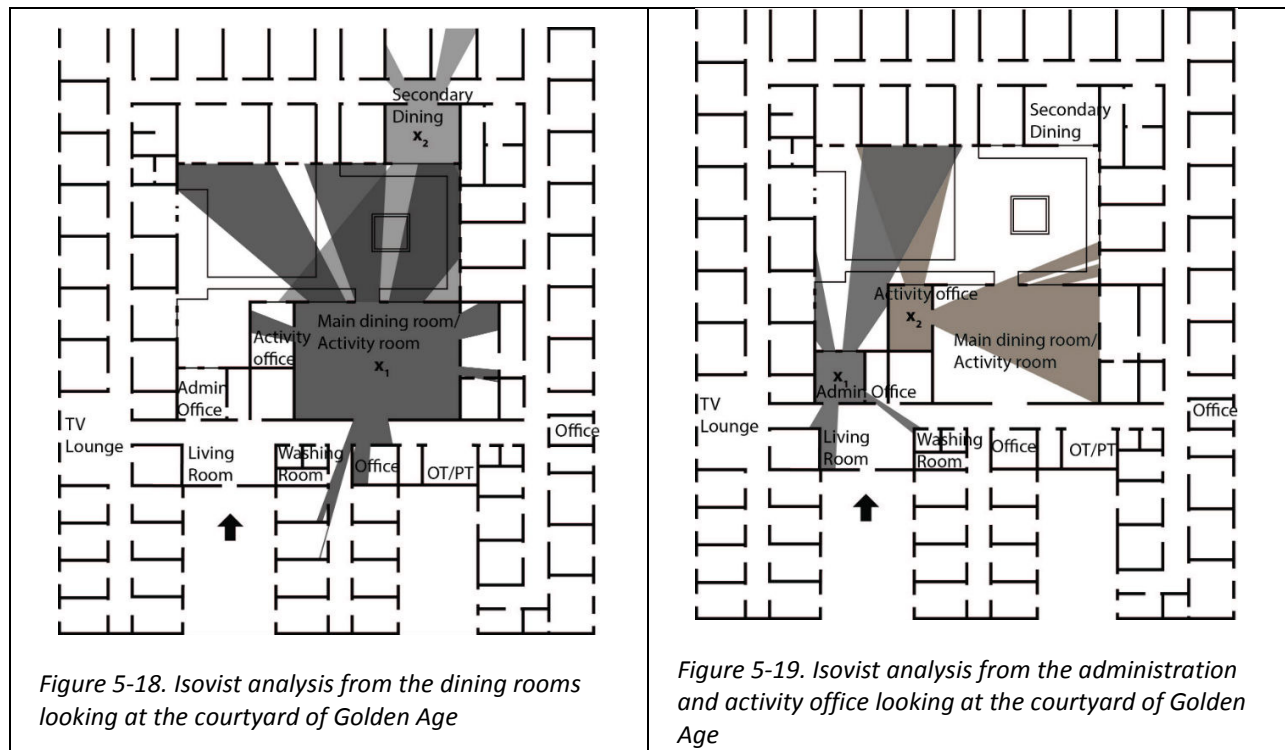


Figure 5-18. Isovist analysis from the dining rooms looking at the courtyard of Golden Age

Figure 5-19. Isovist analysis from the administration and activity office looking at the courtyard of Golden Age

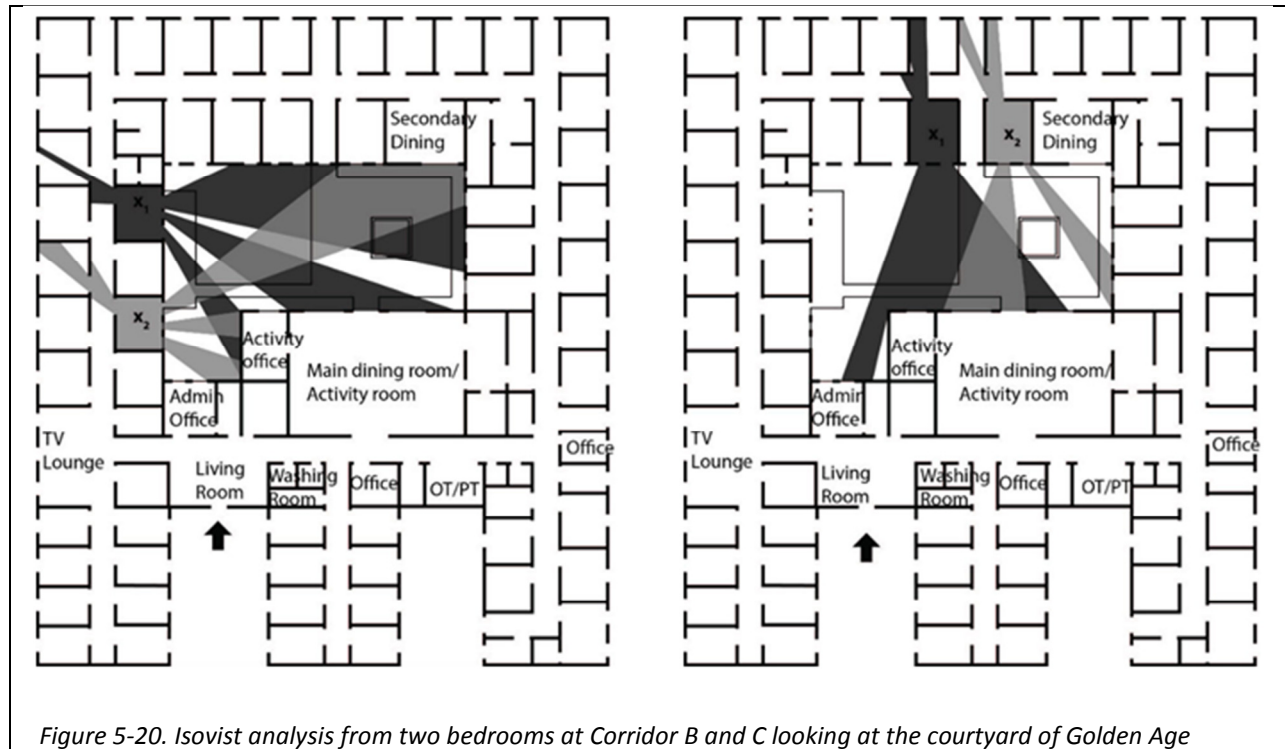


Figure 5-20. Isovist analysis from two bedrooms at Corridor B and C looking at the courtyard of Golden Age

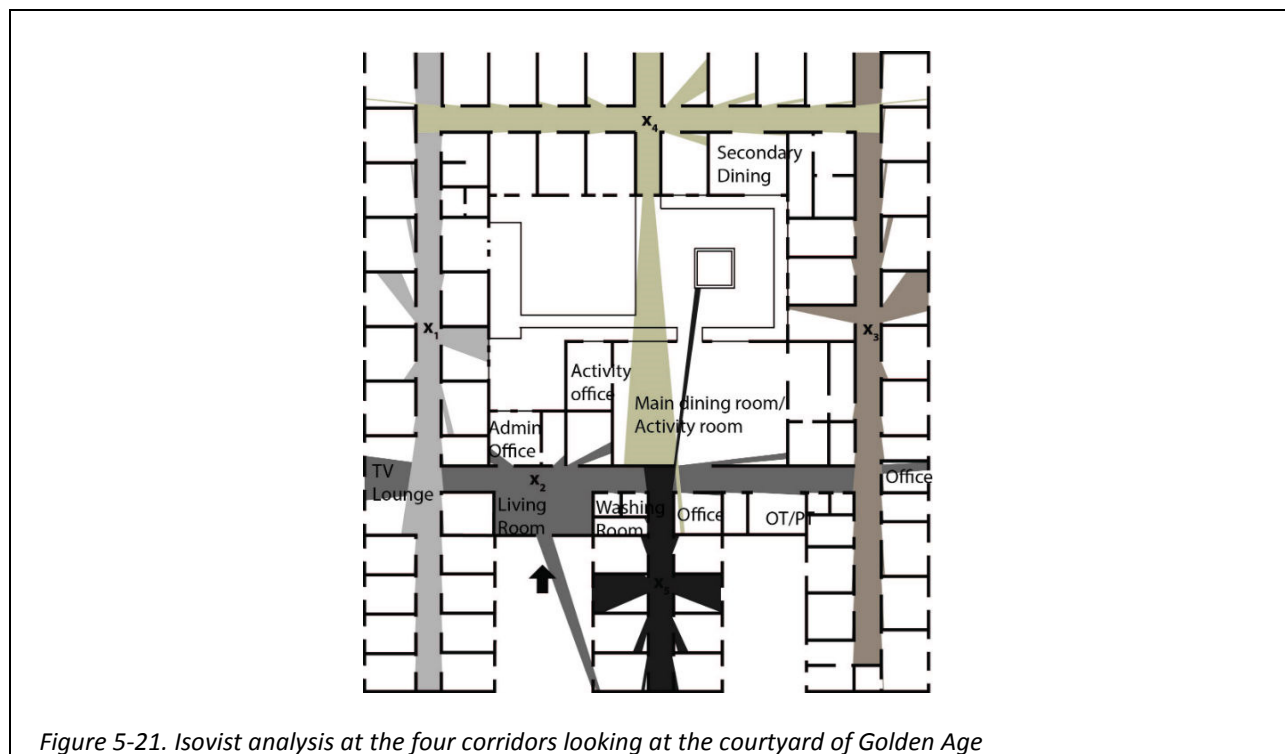


Figure 5-21. Isovist analysis at the four corridors looking at the courtyard of Golden Age

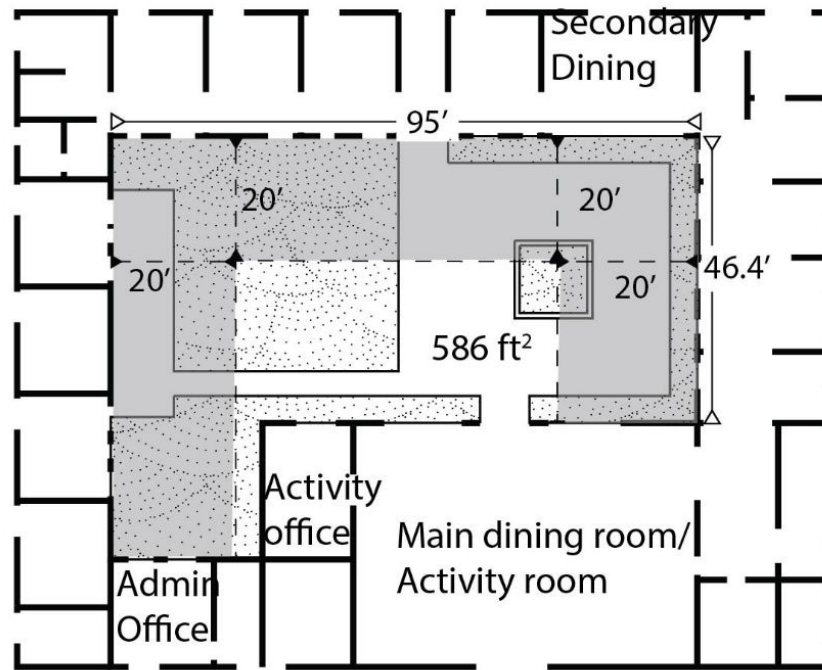


Figure 5-22. Drawing of 20-foot visual buffer zone of the courtyard at Golden Age

2) Spatial arrangement

▪ Layout

The whole area is divided into two almost equal-sized pieces: a paved patio and a grassy land. A dead-end path is extended from the patio to the grass, forming an incomplete loop (Figure 5-23). The patio and path are paved with concrete slabs. No sections are defined to distinguish walkways with gathering space. Some behavioral conflicts have been observed. For example, people crowd the path under an oak tree for shade, which makes wheelchair transportation becomes difficult. The incomplete loop also caused confusion. It leads people to a dead end.

A strong fish-bowl effect is created at the patio. Public attention is channeled to the center of the courtyard where furniture is located. Residents often stay at a place that is off focus.

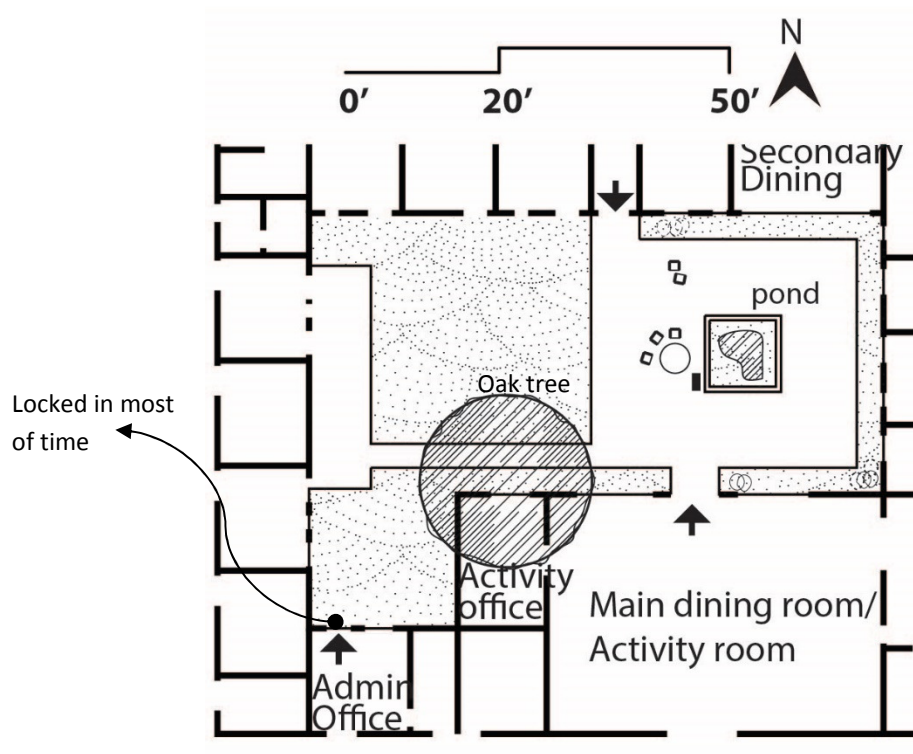


Figure 5-23. Layout of the courtyard at Golden Age

- **Exit/Entry**

The courtyard has two major exits/entries: one at the north connecting with Corridor C and the other at the south connecting the dining room. A third entry is at the administrator's office. It is always locked.

The south entry/exit is very inaccessible due to a high threshold and heavy sliding door. It is used by staff when they bring residents to the courtyard, and by some mobile residents who are allowed to use the outdoor independently. An automatic door with an opener is installed at the north entry. The easy access allows wheelchair users to visit the courtyard independently.

- ***Spatial variety***

There are not many spatial varieties in the courtyard. The whole setting has no shaded space provided by outdoor structure or shading device, no transitional area between indoor and outdoor space (Figure 5-24) and no seating areas with different levels of enclosure (Figure 5-25).



Figure 5-24. Simulating the courtyard at Golden Age with sunlight at 10:00 am



Figure 5-25. Simulating the courtyard at Golden Age with sunlight at 3:00 pm

3) Depth and density

The scale of the courtyard in terms of depth and density exceeds state-level requirements (Table 5-15). Most of bedroom windows surrounding the courtyard have a deep front clear open space, which

is over the code defined by Alabama and Minnesota that requires 20 feet of open space in front of bedroom windows.

Overall outdoor space in Golden Age includes outdoor areas adjacent to the facility and the courtyard space. The outdoor space at the outside edges has 15,920 square feet including a front patio (726 square feet) and several lawn sections (15,194 square feet in total). The courtyard space has approximately 1,945 square feet including 1,508-square-foot patio surface and 2,853-square-foot green space. The outdoor areas in total ensure 257.6 square feet per bed for outdoor space and 27.6 square feet per bed for activity (patio) space. The two aspects exceed what has been required in Wisconsin's and Connecticut's outdoor guidelines. The courtyard gives 61 square feet per bed for enclosed outdoor space. The space is much more than the requirement in Massachusetts's guideline.

The density of outdoor use is low. According to the observation data, there is an average of 2.2 residents and a maximum of 10 residents per half-hour in the courtyard. Each user shares a great amount of outdoor space (Table 5-15).

Table 5-15. Comparison of Golden Age's square footage per bed for outdoor space with state-level

Density \ Area		Golden Age	Wisconsin	Massachusetts	Connecticut
Outdoor density	Square footage per bed for overall outdoor space	257.6	15	n/a	100
	Square footage per bed for courtyard space	61	n/a	25	n/a
	Square footage per bed for activity (patio) space	27.6	n/a	n/a	10
Avg. density in use of the courtyard*	Square footage per person for overall courtyard	2304	n/a	n/a	n/a
	Square footage per person for activity (patio) area	703	n/a	n/a	n/a
Max. density in use of the courtyard**	Square footage per person for overall courtyard	494.5	n/a	n/a	n/a
	Square footage per person for activity (patio) area	150.8	n/a	n/a	n/a

*Space divided by **Avg. # of person** per half-hour interval snapshot-observation

Space divided by **Max. # of person in a half-hour interval snapshot-observation

2. Sensory properties

Golden Age's courtyard is discussed in terms of its 1) color selection, 2) sound levels, 3) material with tactile quality, 4) olfactory resources and 5) garden-grown food. These factors are important features triggering five-sensory experience. In general, the place is lacking in quality and diverse sensory experience.

1) Color selection

Digital images

Thirteen pictures (Figure 5-26) are selected to capture different details of the courtyard. They illustrate colors of building façade, landscape elements, furniture and concrete pavement. Photos with a close-up shot (e.g., image D, E & L) record plant material with distinct colors. Photos with a medium or

long shot (e.g., image A, B & H) aid in understanding of overall color distribution from a specific perspective.

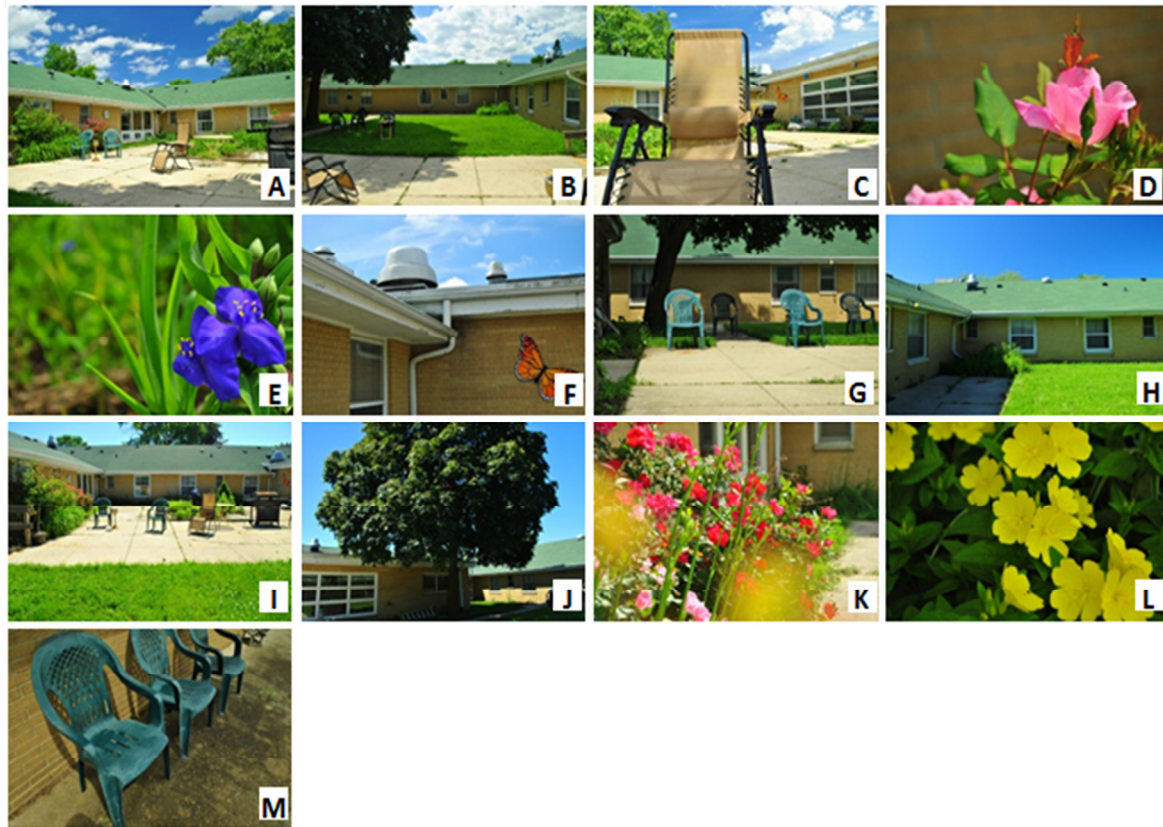


Figure 5-26. Thirteen selected images for color analysis

Results of color analysis

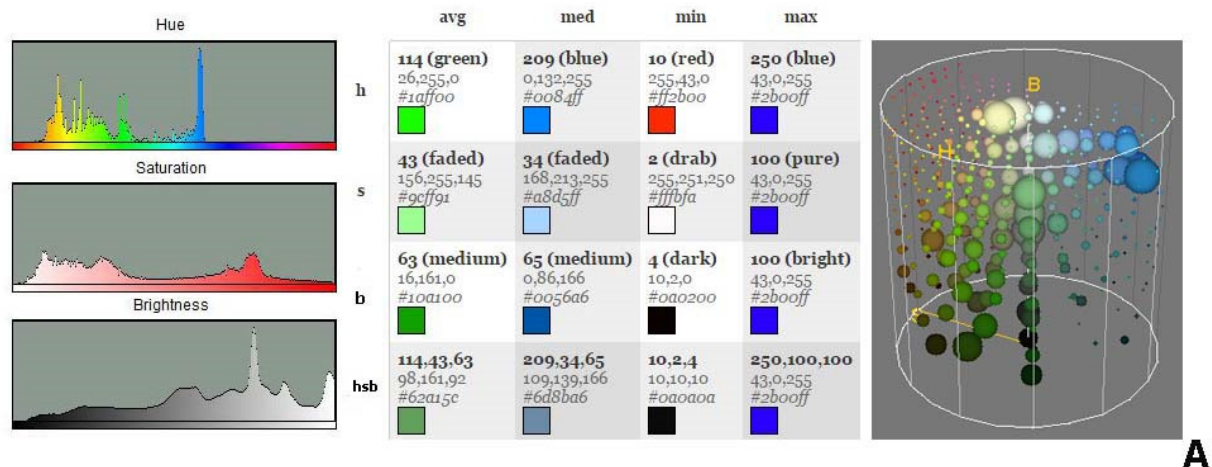
Results of HSB analysis are shown in Table 5-16. Overall, the courtyard is painted with faded green, orange and yellow. Colors of sky and flowing plants enrich views of the courtyards and prevent the courtyard from being too pale. Colors of furniture do not stand out but blend with background environments. Given certain angles and strength of sunlight, the concrete paving may cause glare in summer time.

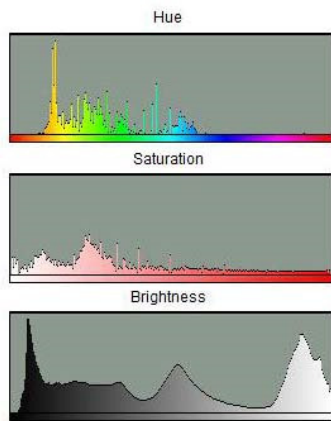
Mean values of hue of the 13 images range from 43 (orange) to 144 (green). Eleven images have an average hue between 81 and 144. That means the courtyard is greenish on average. Eight images have a median hue between 41 and 59, suggesting a great amount of pixels (or areas) in the images are associated with the colors of brick walls, furniture and pavement.

Eleven images have mean and medium color saturation as “faded”. The other two (Image E with purple spiderworts and Image L with yellow evening primroses) have either “rich” or “pure” one, which help add vividness into the courtyard.

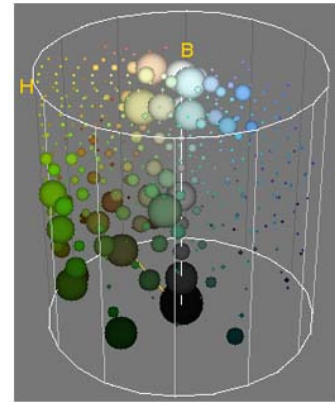
As shown in the color 3D models, colors of landscape materials (e.g., 90°, 96%, 74%, olive drab) show high saturation and medium brightness. Colors of the roof (e.g., 120°, 32%, 74%, dark see green), brick walls (e.g., 40°, 57%, 62%, peru) and concrete pavement (e.g., 60°, 24%, 97%) give faded saturation and medium-to-high brightness. Glare (high brightness) may come from reflection on concrete pavement (Table 5-16, Image G & I).

Table 5-16. Results of color analysis of the courtyard of Golden Age

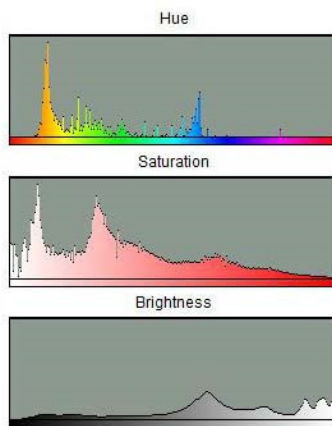




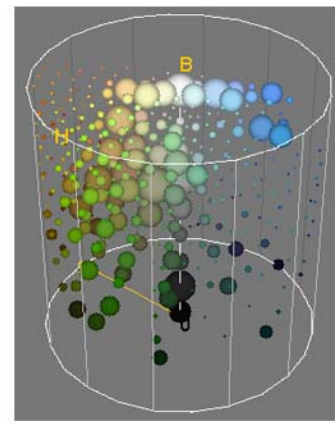
	avg	med	min	max
h	103 (green) 72,255,0 #48ff00	49 (orange) 255,208,0 #ffa000	0 (black) 255,0,0 #ff0000	345 (red) 255,0,64 #ff0040
s	38 (faded) 186,255,158 #baff9e	29 (drab) 255,241,181 #ffa1b5	0 255,255,255 #ffffff	100 (pure) 255,0,64 #ff0040
b	51 (medium) 37,130,0 #258200	51 (medium) 130,106,0 #826a00	2 (dark) 5,0,0 #050000	100 (bright) 255,0,64 #ff0040
hsb	103,38,51 95,130,81 #5f8251	49,29,51 130,123,92 #827b5e	0,0,2 5,5,5 #050505	345,100,100 255,0,64 #ff0040



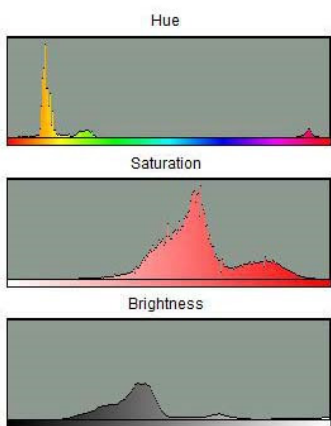
B



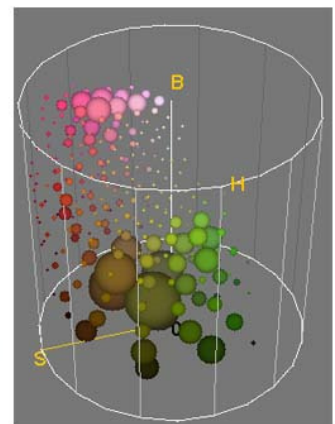
	avg	med	min	max
h	97 (green) 98,255,0 #62ff00	43 (orange) 255,183,0 #ffb700	0 (black) 255,0,0 #ff0000	353 (red) 255,0,30 #ff001e
s	35 (faded) 200,255,166 #c8ffa6	31 (faded) 255,233,176 #ffe9b0	0 255,255,255 #ffffff	100 (pure) 255,0,30 #ff001e
b	64 (medium) 63,163,0 #2fa300	63 (medium) 161,115,0 #a17300	2 (dark) 5,0,0 #050000	100 (bright) 255,0,30 #ff001e
hsb	97,35,64 128,163,106 #80a36a	43,31,63 161,147,111 #a1936f	0,0,2 5,5,5 #050505	353,100,100 255,0,30 #ff001e



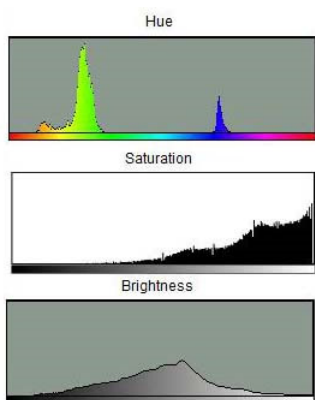
C



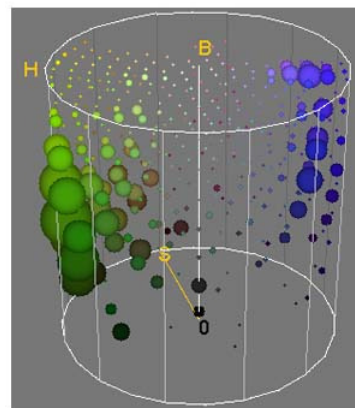
	avg	med	min	max
h	43 (orange) 255,183,0 #ffb700	41 (orange) 255,174,0 #ffa000	0 (red) 255,0,0 #ff0000	359 (red) 255,0,4 #ff0004
s	59 (faded) 255,212,105 #ffd469	58 (faded) 255,208,107 #ffd06b	12 (drab) 255,224,224 #ffe0e0	100 (pure) 255,0,4 #ff0004
b	47 (medium) 120,86,0 #785600	42 (medium) 107,73,0 #6b4900	5 (dark) 13,0,0 #0d0000	100 (bright) 255,0,4 #ff0004
hsb	43,59,47 120,100,49 #786431	41,58,42 107,87,45 #6b572d	0,12,5 13,11,11 #0d0b0b	359,100,100 255,0,4 #ff0004



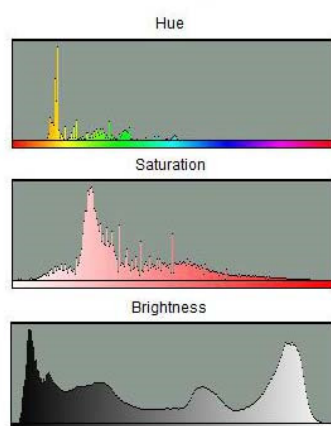
D



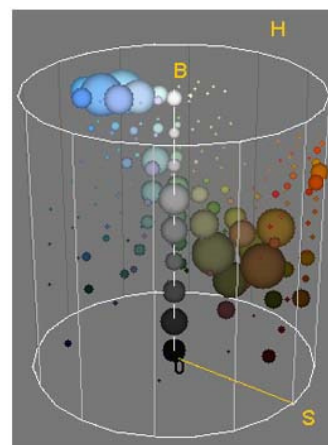
	avg	med	min	max
h	101 (green)	89 (green)	14 (red)	353 (red)
	81,255,0	132,255,0	255,60,0	255,0,30
	#51ff00	#84ff00	#ff3c00	#ff001e
s	83 (rich)	87 (pure)	9 (drab)	100 (pure)
	110,255,43	148,255,33	255,237,232	255,0,30
	#6eff2b	#94ff21	#ffede8	#ff001e
b	52 (medium)	52 (medium)	5 (dark)	100 (bright)
	42,133,0	69,133,0	13,3,0	255,0,30
	#2a8500	#458500	#0d0300	#ff001e
hsb	101,83,52	89,87,52	14,9,5	353,100,100
	57,133,23	77,133,17	13,12,12	255,0,30
	#398517	#4d8511	#0d0c0c	#ff001e



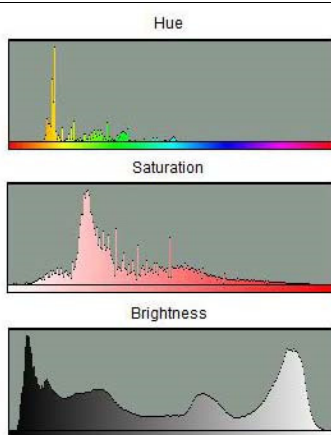
E



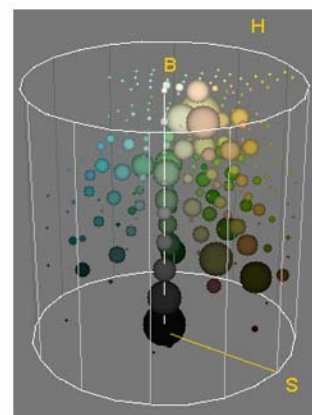
	avg	med	min	max
h	81 (lime)	50 (yellow)	0 (black)	330 (red)
	166,255,0	255,213,0	255,0,0	255,0,128
	#a6ff00	#ffd500	#ff0000	#ff0080
s	36 (faded)	30 (faded)	0	100 (pure)
	223,255,163	255,242,179	255,255,255	255,0,128
	#dffa3	#ff2b3	#ffff	#ff0080
b	48 (medium)	47 (medium)	0 (dark)	94 (bright)
	80,122,0	120,100,0	0,0,0	240,0,120
	#507a00	#786400	#000000	#f00078
hsb	81,36,48	50,30,47	0,0,0	330,100,94
	107,122,78	120,114,84	0,0,0	240,0,120
	#6b7a4e	#787254	#000000	#f00078



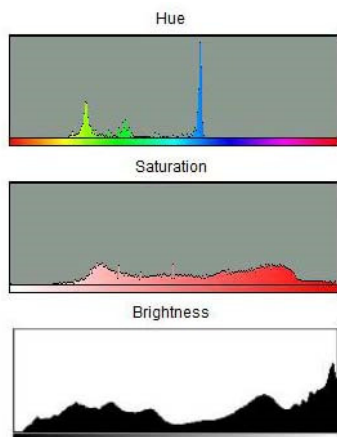
F



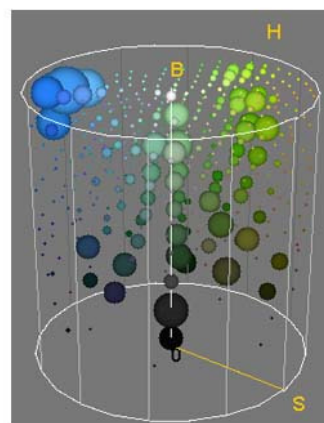
	avg	med	min	max
h	81 (lime)	50 (yellow)	0 (black)	330 (red)
	166,255,0	255,213,0	255,0,0	255,0,128
	#a6ff00	#ffd500	#ff0000	#ff0080
s	36 (faded)	30 (faded)	0	100 (pure)
	223,255,163	255,242,179	255,255,255	255,0,128
	#dffa3	#ff2b3	#ffff	#ff0080
b	48 (medium)	47 (medium)	0 (dark)	94 (bright)
	80,122,0	120,100,0	0,0,0	240,0,120
	#507a00	#786400	#000000	#f00078
hsb	81,36,48	50,30,47	0,0,0	330,100,94
	107,122,78	120,114,84	0,0,0	240,0,120
	#6b7a4e	#787254	#000000	#f00078



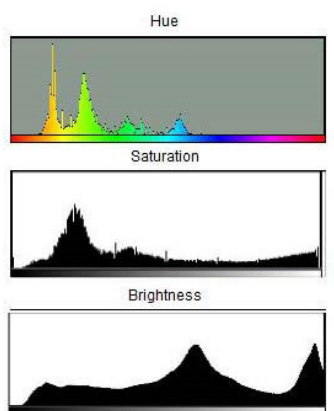
G



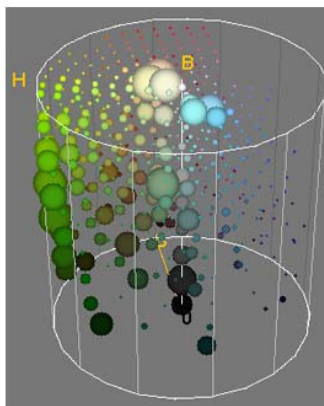
	avg	med	min	max
h	144 (green) 0,255,102 #00ff66	210 (blue) 0,128,255 #0080ff	57 (yellow) 255,242,0 #ffff200	270 (violet) 128,0,255 #8000ff
s	58 (faded) 107,255,166 #6bff66	61 (faded) 99,177,255 #63b1ff	7 (drab) 255,254,237 #fffeed	95 (pure) 134,13,255 #860dff
b	64 (medium) 0,163,65 #00a341	75 (bright) 0,96,191 #0060bf	4 (dark) 10,10,0 #0a0a00	100 (bright) 128,0,255 #8000ff
hsb	144,58,64 69,163,106 #45a36a	210,61,75 75,133,191 #4b85bf	57,7,4 10,10,9 #0a0a09	270,95,100 134,13,255 #860dff



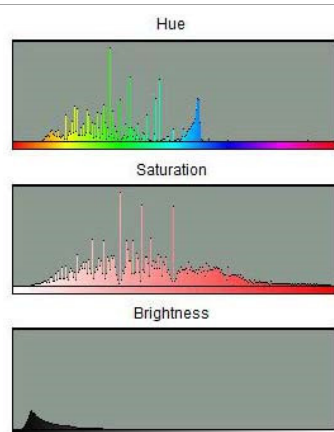
H



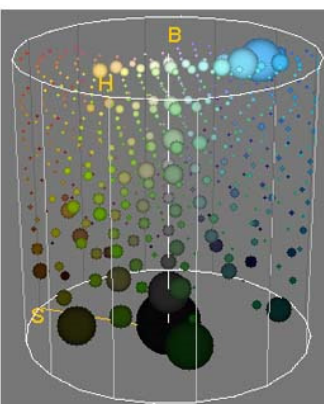
	avg	med	min	max
h	94 (green) 111,255,0 #6ff00	88 (green) 136,255,0 #88ff00	7 (red) 255,30,0 #ff1e00	240 (blue) 0,0,255 #0000ff
s	51 (faded) 181,255,125 #b5ff7d	39 (faded) 209,255,156 #d1ff9c	3 (drab) 255,248,247 #fff8f7	100 (pure) 0,0,255 #0000ff
b	61 (medium) 67,156,0 #439c00	60 (medium) 82,153,0 #529900	2 (dark) 5,1,0 #050100	100 (bright) 0,0,255 #0000ff
hsb	94,51,61 111,156,76 #6f9c4e	88,39,60 125,153,93 #7d995d	7,3,2 5,5,5 #050505	240,100,100 0,0,255 #0000ff



I



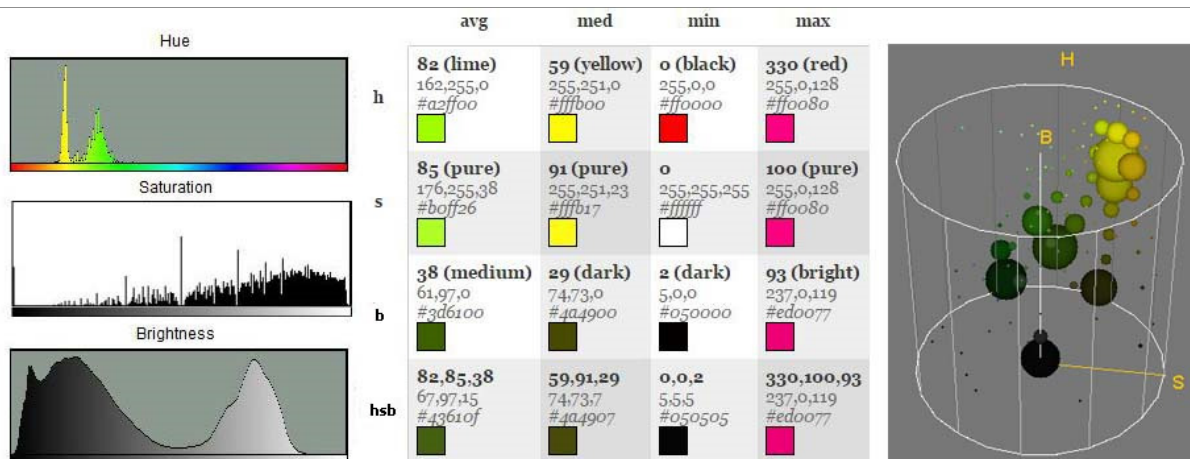
	avg	med	min	max
h	128 (green) 0,255,34 #00ff22	120 (green) 0,255,0 #00ff00	0 (black) 255,0,0 #ff0000	230 (blue) 0,43,255 #002bff
s	41 (faded) 150,255,164 #96ffa4	39 (faded) 156,255,156 #9cfff9c	0 255,255,255 #ffffff	100 (pure) 0,43,255 #002bff
b	35 (medium) 0,89,12 #00590e	20 (dark) 0,51,0 #003300	0 (dark) 0,0,0 #000000	100 (bright) 0,43,255 #002bff
hsb	128,41,35 53,89,58 #35593a	120,39,20 31,51,31 #1f331f	0,0,0 0,0,0 #000000	230,100,100 0,43,255 #002bff



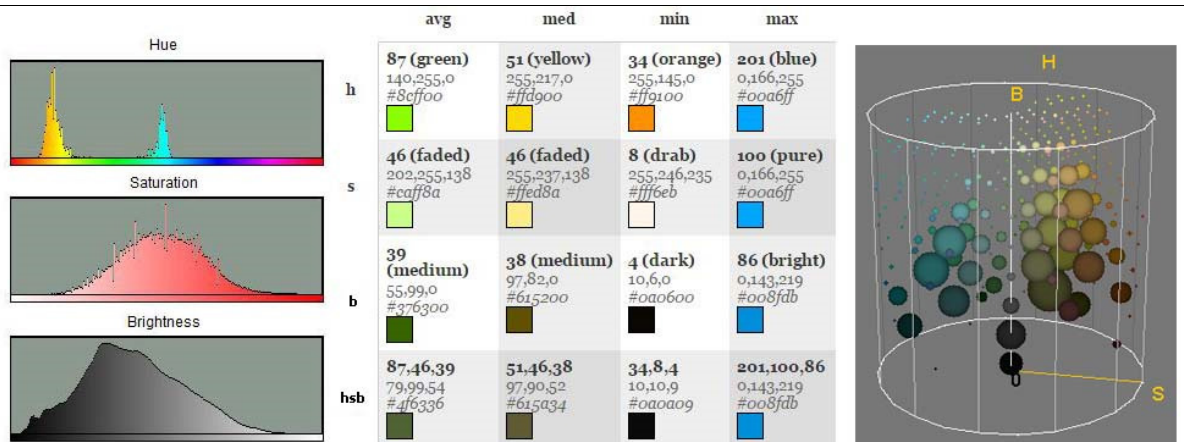
J



K



L



M

2) *Level of sounds*

The courtyard provides comfortable hearing experience in general. Sources of sounds in the courtyard include different kinds of machines, street traffic and wild life. The sound levels were measured every half hour at the center of the patio. Total 78 records were created. The mean value is 53.88 ± 3.80 dB with a range between 50 and 65 dB. The maximum value is produced by vehicles passing in front of the facility. Air conditioners and machines also create noticeable noise. According to the NIDCD's standard (National Institute on Deafness and Other Communication Disorder), this courtyard has a comfortable hearing level (less than 60 dB) (Table 5-17).

According to the EPA's (Environmental Protective Agency) limit (less than 55 dB), the sound level of the courtyard is tolerable.

Table 5-17. Comparison of Golden Age's sound levels with different criteria defining "quietness"

	Golden Age's courtyard	NIDCD's standard	EPA's recommendation
Noise level (Db)	53.88 ± 3.80 (mean)	<60	<55

3) *Material with tactile quality of surface*

The tactile experience may be triggered through interacting with plants or by just being in this courtyard.

Natural materials

There was a lack of maintenance in the courtyard. Rampant weeds take over some areas, prompting residents to take care of the uncontrolled garden. Some residents pull the weeds with gloved hands or try to water the gardens. Since planting areas are at the ground level, residents have to band their body to reach plants.

Wind

Wind speeds were measured every half hour at the central patio. A total of 83 records were created. An average wind speed during the six day observation is 3.11 ± 2.04 mph with the range

between 0 and 9.4 mph. Daily data is summarized in Table 5-18. According to the Beaufort criteria (Table 5-8), the courtyard can be described as “calm” or “light-air”.

Table 5-18. Wind speeds of the courtyard at Golden Age (mph)

	17-Jun	18-Jun	19-Jun	20-Jun	22-Jun	23-Jun	
Max	7.4	9.4	5	4.1	5.4	6.2	Max=9.4; Min=4.1; Avg = 6.52
Min	2	3.4	0	0	0	0	Max=3.4; Min=0; Avg = 0.9
Avg	3.75	5.52	2.28	2.34	2.25	2.75	Overall average: 3.11± 2.0

Temperature

Based on the information of the National Weather Service (NWS), the weather during the observation period (between 10: 00 and 5:00 pm from June 17 to 23, 2013) permitted outdoor activities (Table 5-19).

Table 5-19. Air temperature between July 3rd and 11th , 2013 (°F) at the courtyard of Golden Age

	17-June	18-June	19-June	20-June	22-June	23-June	
Max.	84.2	64.4	71.6	82.4	75.2	86	Max=86 ;Min=64.4; Avg = 77.3
Min.	62.6	60.8	66.2	73.4	71.6	78.8	Max=78.8; Min=60.8; Avg=68.9
Avg.	78.5	63.1	69.5	79.5	73.6	83.3	Overall Avg = 74.6

However, the temperature measured at the central patio (Table 5-20) was much higher than the air temperature reported by the NWS. Several reasons may make meters read a higher number including little green space, heat radiation from building materials and the sun-soaked meter.

Table 5-20. Temperature measured at the courtyard (°F) at the courtyard of Golden Age

	17-June		18-June		19-June		20-June		22-June		23-June			
	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun
Max	90	100	85	93	78	93.6	86	97	80	90	92	98	Max=92	Max=100
													Min=78	Min=93
													Avg = 85.2	Avg = 95.3
Min	77	83	67	70	69	79	76	79	74	76	84	93	Max=84	Max=93
													Min=67	Min=70
													Avg = 74.5	Avg = 80
Avg	84.5	91.5	70.6	77.7	73.6	87.5	82.2	91.4	77.6	83.5	89.3	95.9	Overall Avg = 79.4	Overall Avg =88

The temperature in the sun was 88 degree with ranges between 100 and 70 degree. According to the indoor-temperature requirements in different states (Table 5-21), staying in the sun may cause safety problems in the courtyard.

Table 5-21. Comparison of the Golden Age's temperature with state-level requirement of thermal comfort (°F)

	Measured courtyard temperature at Silver Life in summer		Standard in Wisconsin	Standard in Arizona	Standard in Arkansas
	shade	sun			
Temperature	79.4	88	72 (Min.)	71 (Min.) 84 (Max.)	75 (Min.) in winter 80 (Max.) in summer

4) Olfactory resource and garden-grown food

There was a lack of positive olfactory and taste stimulation in the courtyard. Sources of olfactory stimulation include flowering plants and cigarettes during the observation period. Residents are allowed to smoke; the courtyard was filled with strong cigarette smell. The smell cancels out flower fragrance and may drive away non-smokers, making the courtyard almost exclusive to resident and staff smokers.

The courtyard in the previous year had more varieties of sensory stimulation. A patch of vegetables like tomatoes and green peppers was created for residents. According to the staff, residents constantly checked these plants, talked about them and had opportunities to taste the garden-grown food. Unfortunately, vegetable planting was not carried on due to a lack of budget.

3. Building-system properties: built & human-made features

Built & human-made elements in the courtyard can be grouped into 1) wheelchair friendly features, 2) outdoor furniture, 3) plant and animal supplies, 4) cultural symbols, 5) water features, 6) emergency communication device and 7) information device (Table 5-22). One major accessible feature is an automatic door with an opener. It is installed at the south entrance, allowing independent access. The other entrance (the north entry) has a heavy sliding door with a threshold. It is impossible to travel through the door without staff assistance.

Outdoor furniture in the courtyard includes two movable aluminum mesh tables, four plastic chairs and four movable ashtray stands. The tables are too heavy to move by a person, and the plastic chairs are not very durable. During the observation period, a family member fell because the chair he sat was tipping over and broken. Four ashtray stands are scattered around the courtyard for smokers.

Most of plants are grown on the ground. Except rose bushes, they are below an eye level of a wheelchaired person. Although a trellis was attached on the west side of the wall, no plants climb the structure to add vertical variation.

Two birdhouses hang underneath eaves, requiring a face-up view to find the spots. According to the activity director, birds never came to nest but no attempt was made to relocate them. To attract birds, residents saved bread crumbs and scattered them on the ground. A pond pump and spray nozzle are constantly turn off due to some maintenance issues related to water leaking.

Table 5-22. Building-system elements in the courtyard of Golden Age

Category		Description	Purpose
Wheelchair friendly features	Wheelchair accessible door with an automatic push pad	Facilitating access from the south entrance	<ul style="list-style-type: none"> • Maximizing accessibility of the courtyard
Outdoor furniture	Outdoor furniture	Two movable aluminum mesh tables and four plastic chairs	<ul style="list-style-type: none"> • Providing seating space for ambulatory residents and family members • Giving flexibility to move the furniture based on the need of activities
	Outdoor ashtray Stand	Four movable ashtray stands	<ul style="list-style-type: none"> • Allowing smokers to smoke anywhere in the patio
Plant and animal supplies	Trellis Shepherd hooks and trellis	Steel hooks for hanging planters and bird feeders	<ul style="list-style-type: none"> • Making plants more visible by adding vertical variation to the courtyard • Supporting climbing plants
	Bird houses		<ul style="list-style-type: none"> • Attracting wild birds
Cultural symbol	Sculptures and butterfly decoration		<ul style="list-style-type: none"> • Prompting reminiscence
Water features	Pond and water spray		<ul style="list-style-type: none"> • Providing auditory stimulation
Emergency communication device	An electronic bell	A bell on the rail outside the south rail	<ul style="list-style-type: none"> • Allowing residents to contact indoor staff
Information device	Thermal meter		<ul style="list-style-type: none"> • Providing information of outdoor temperature

C. Support of experience attributes

The courtyard was evaluated by the activity director and researcher using Courtyard Audit Tool for Physical Settings (Appendix G). Results are illustrated in Figure 5-27. The mean of overall director's ratings is 1.89. Each of the attributes is given a score less than 2.8. The highest rating given by the director is "Accessible space & built features", followed by "Awareness & orientation" and "Familiarity".

The mean score of the researcher's evaluation is 1.71, lower than what the director reads. "Familiarity" is assigned a highest score, followed by "Awareness & orientation" and "Participation in meaningful activity". The reason is that residents are quietly allowed (or not discouraged) to have some activities they used to do at home. The physical settings facilitate or induce these activities that may

enhance a past social role: a farmer, gardener or a person who does not want to waste food. In the courtyard, it was easy to find leftover breads on the ground, several piles of pulled weeds and cigarette butts. Although the environment is shown as unorganized, it may give a sense of being at home and a feel of flexibility of messing up.

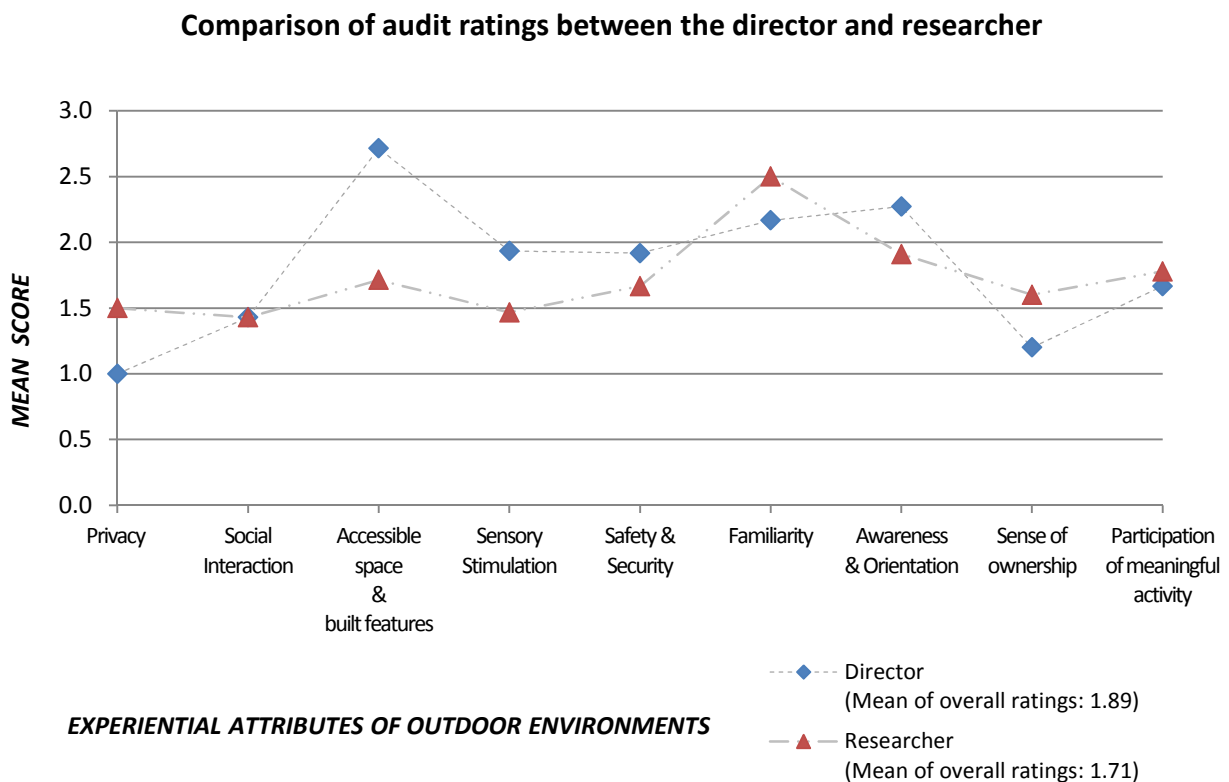


Figure 5-27. Results of assessing physical environments of the courtyard at Golden Age

IV. Courtyard at Elderly Living

A. Overview of facility building

Elderly Living is located at City of South Milwaukee (11.8 miles from downtown Milwaukee). The facility is located in a census tract with 2,471 residents, in which Caucasians make up 91.7 percent of the population. It has approximately 26.5 percent of population aged 65 and older, which is the highest proportion among the census tracts of the three studied cases. The median house income of the tract is \$43,814, lower than that of Wisconsin (\$52,627). Occupations related to “production, transportation and material moving” take away the majority of male labor force (50.4%).

The facility opened in 1988. It neighbors upon an assisted-living facility and stays in a close proximity with another nursing home. These facilities and some retail stores are sandwiched in between two residential areas characterized by two-story detached houses or apartments.

Elderly Living is a one-story, centipede building with stone and brick structures. The exterior parts are quite institutional and monotonous. Major parts of the building are featured by a flat roof design with blue parapets, and buff-gray walls with aluminum window frames.

Elderly Living separates its long-term from short-term units. The focus of this study —long-term units — is in a typical double-loaded corridor plan and encloses a trapezoid-shaped courtyard (see Figure U-1 in Appendix U). One of its corridors is splayed to insert offices, working station and utility rooms, resulting in a more complicated layout than that of Silver Life and Golden Age. As shown in the result of NodeXL analysis (see Figure U-2 & Table U-1 in Appendix U), spatial organization of Elderly Living is formed by two spatial clusters, each of which varies in its spatial depth and relations with activity and office space. More specifically, its spatial structure is characterized by 1) a long transitional area between internal and external environments, 2) a duo-core structure and 3) social space with high spatial depth. More discussions are provided in Appendix U.

B. Physical settings of the courtyard

In general, Elderly Living's courtyard has complicated. It is lacking in multiple-sensory stimulation but have different varieties of furniture to accommodate social interactions and outdoor recreation.

1. Spatial properties

In general, the courtyard can be easily accessed or observed by residents in the inner rings of the corridors. To residents at the outer rings, viewing or visiting the courtyard is extremely difficulty. Spatial organization of the courtyard is complicated, which challenges residents with cognitive impairment to leave the same way they enter. The courtyard has a very generous size, which may help prevent fishbowl effects.

1) Indoor-outdoor relations

- ***Physical connection: geodesic and physical distance***

The layout of Elderly Living creates two different navigation plans. It favors access to the courtyard from Corridor B, C & D but creates obstacles to outdoor visits from Corridor E. Residents in Corridor E may experience long geodesic and physical distance. They have to pass four different places and walk at least 100 feet to the courtyard (Table 5-23).

Table 5-23. Distance between the courtyard and major indoor spaces in Elderly Living

	Geodesic distance	Physical distance (ft.)
Entry vestibule	4	88
Corridor A	3	71 to 105
Corridor B (residence)	2	43 to 143
Corridor C (residence)	2	29 to 67
Corridor D (residence)	3	61 to 133
Corridor E (residence)	5	100 to 196
Corridor F	2	10 to 32
Activity room	4	119
Dining room	1	Adjacent
Resident lounge 1	1	Adjacent
Resident lounge 2	5	62
Nursing station 1	3	110
Nursing station 2	4	35

The dining room and resident lounge at Corridor B have direct access to the courtyard. It was been found that residents took such advantage to balance sensory experience. If the weather becomes too hot or too cold, residents will return to the lounge and stay close to the door to enjoy sunlight.

There is long geodesic and physical distance between the courtyard and activity room. Navigation between the two places becomes very challenging to residents. The resident lounge at Corridor D (Resident Lounge #2) has an extremely complicated connection with the courtyard (five geodesic distances). Despite of the short physical distance, traveling to the courtyard from the lounge requires much more mental effort.

- ***Visual connection:***

According to the floor plan, the central patio of the courtyard can be seen from different spaces at the inner ring of the corridors (Figure 5-28) and also within the courtyard. Its visibility analysis shows that the central patio and entry/exit area of the dining room is the most visible space with over 500 visually-connecting points in the facility (Figure 5-29).

A depth-path analysis (Figure 5-30) illustrates that “Depth-1” areas (space with direct visual access) are located at the inner ring of corridors. People hardly to receive information of outdoor

activities while walking in the hallways (Depth-2 areas) (see also Figure 5-35) or staying at the outer ring (Depth-3 areas). Specific isovist analyses (Figure 5-31) show that people at the dining room have a wide angle of view toward the courtyard. Nursing staff at the resident lounge of Corridor B can browse only half of the courtyard (Figure 5-32).

Due to its generous size and cranberry trees serving as visual buffers (Figure 5-36), the courtyard creates a lower fishbowl effects. People who use patio space would have less feeling of getting public attention. However, some residents are at risk of privacy invasion of their bedrooms. Strollers are able to see the inside of the rooms in some parts of walking paths.

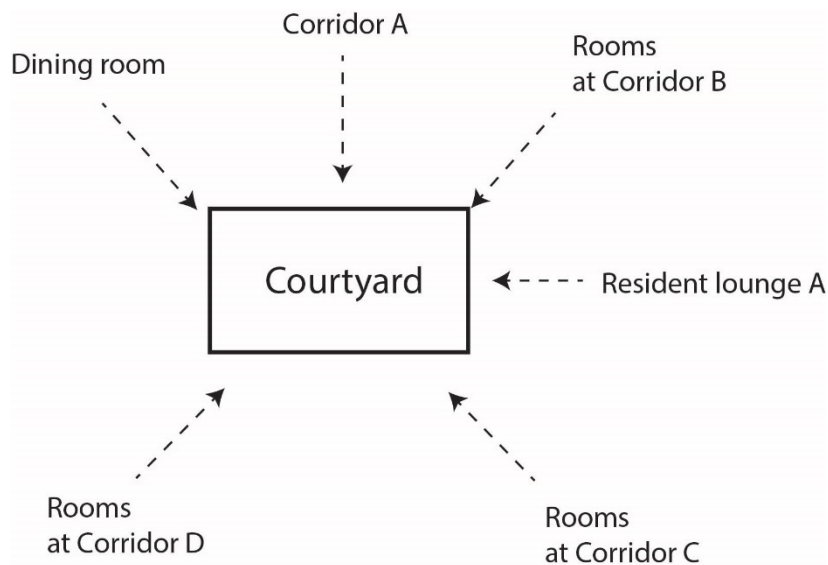


Figure 5-28. Indoor spaces with visual access to the courtyard at Elderly Living

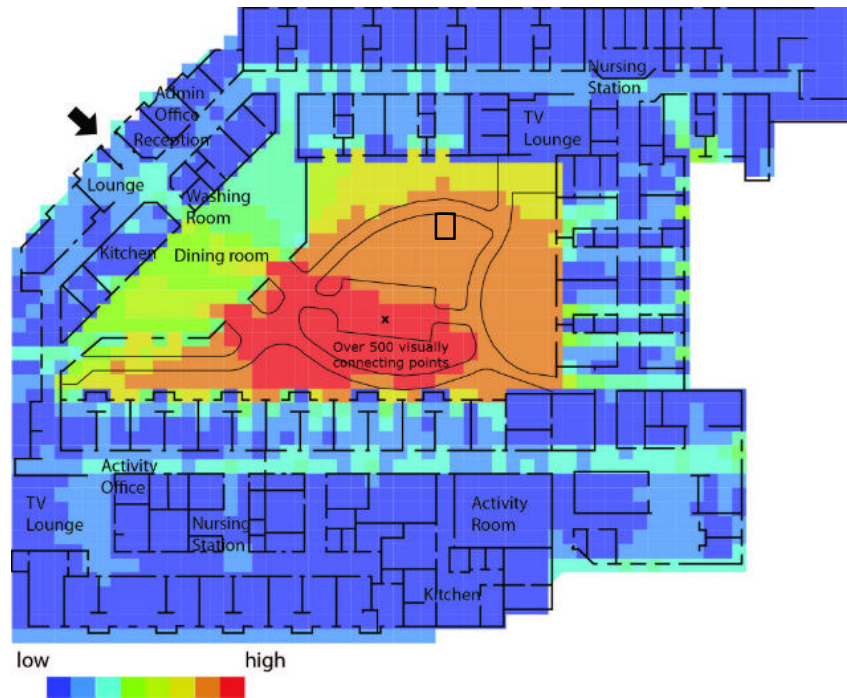


Figure 5-29. Visibility analysis of the courtyard at Elderly Living



Figure 5-30. Depth-path analysis of the courtyard at Elderly Living

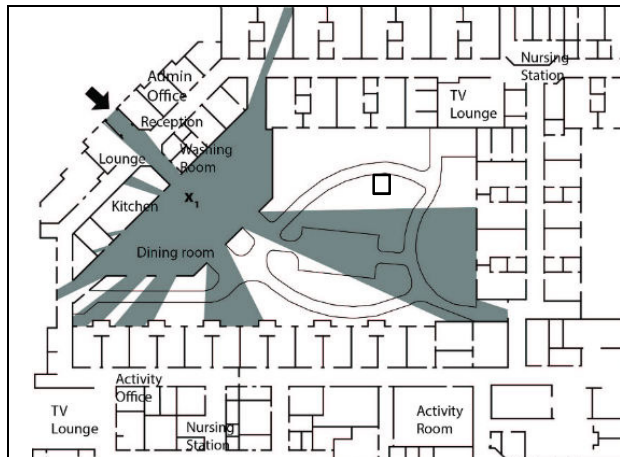


Figure 5-31. Isovist analysis at the dining room looking at the courtyard of Elderly Living

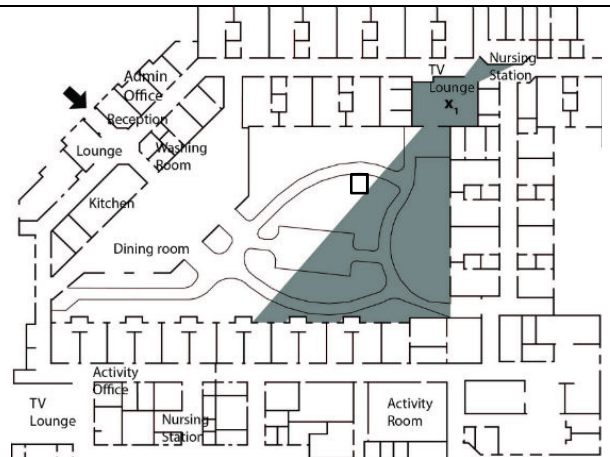


Figure 5-32. Isovist analysis at the lounge at Corridor B looking at the courtyard of Elderly Living

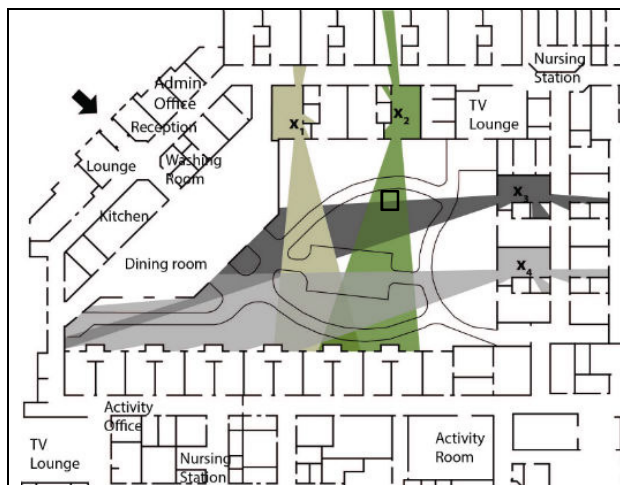


Figure 5-33. Isovist analysis at resident rooms in Corridor B looking at the courtyard of Elderly Living



Figure 5-34. Isovist analysis at resident rooms in Corridor D looking at the courtyard of Elderly Living

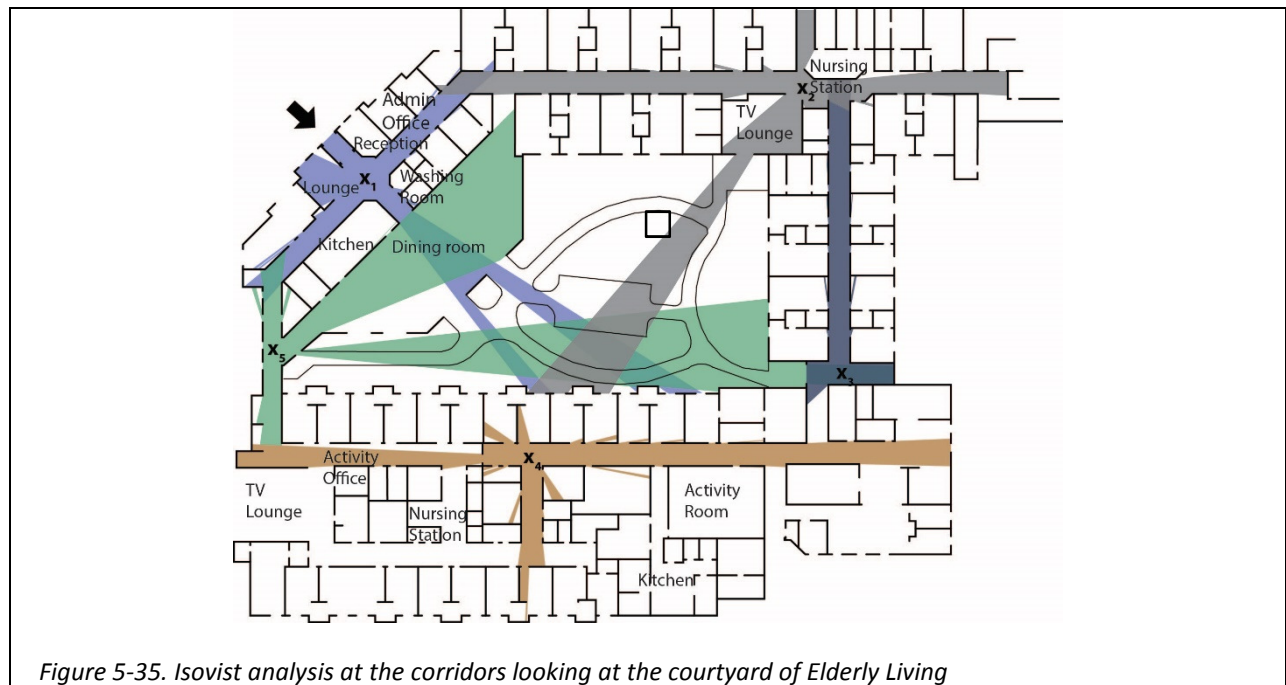


Figure 5-35. Isovist analysis at the corridors looking at the courtyard of Elderly Living

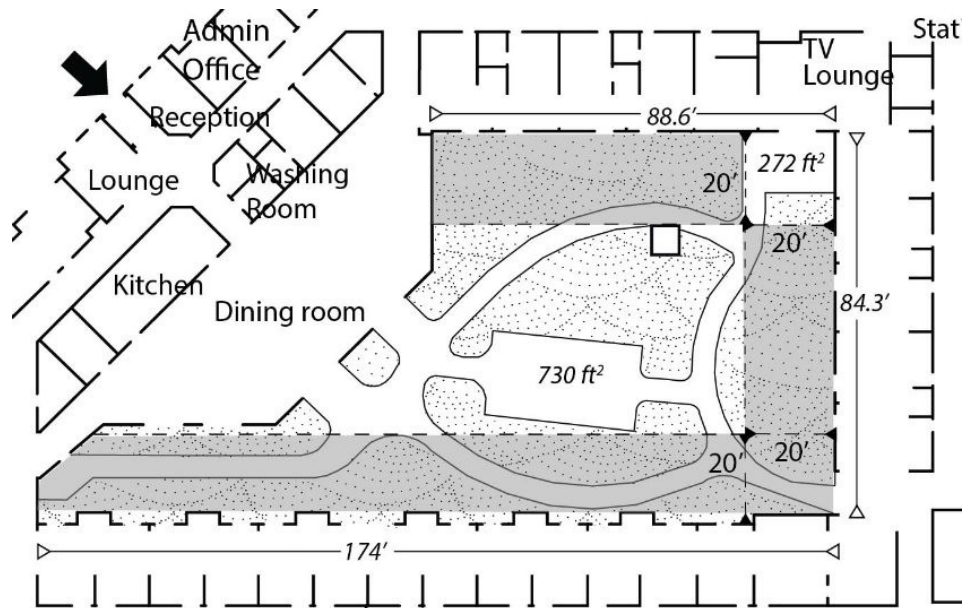


Figure 5-36. Drawing of 20-foot visual buffer zone of the courtyard at Elderly Living

2) Spatial arrangement

▪ Layout

The courtyard's layout (Figure 5-37) is readable in a way that activity spaces are placed along a figure-8-shaped loop. The loop circles the courtyard, and is connected with five exits/entries by short paths. Residents often walk along the loop for a stroll but staff seldom uses it as a shortcut between corridors. Three patios — a central patio, a pergola patio and entry patio—are major activity areas. The central patio is located at the center, becoming a part of the figure-8 loop. It is furnished with chair-and-table sets and also a X-shaped raised bed. The patio is often used as space for planned activities or family gathering. The pergola patio is located off the focal point. It is screened with trellis and climbing plants, and furnished with two double-seat mesh chairs. The patio is constantly occupied by residents and their family members during the observation period. The entry patio sits just outside the resident lounge. It allows residents to preview the whole courtyard, and becomes social areas for residents who have no desire to venture further. The patio is not furnished. To sit there, people have to move chairs from the other two patios.

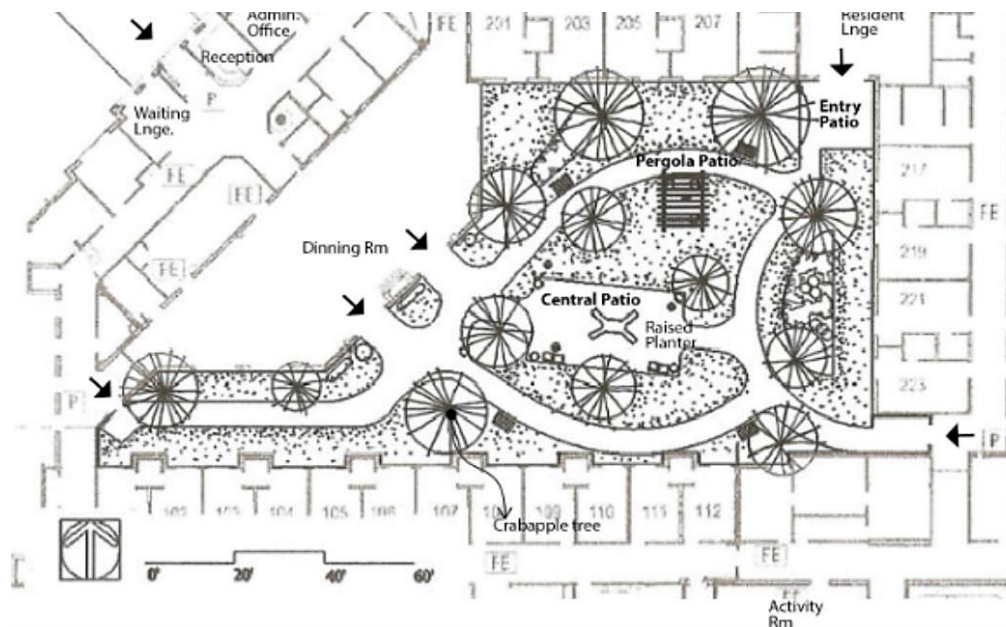


Figure 5-37. Layout of the courtyard at Elderly Living

- ***Exit/Entry***

Five exits/entries lead people to different corridors, creating some issues of orientation and wayfinding. First, some residents do not leave by the same door they enter. Once they leave the courtyard and enter the building, there is no sign to orient towards their destination. Second, there is only one automatic door; however, no landmark or visual cue guides residents to the entry. It has been observed that residents with cognitive impairment constantly use the other four exits with a heavy pull-and-push door.

- ***Spatial variety***

There are not many varieties of seating spaces in the courtyard. Except the pergola, no shading device or extension of roofs provides comfortable seating experience. The shade provided by the thirteen crabapple trees covers most of lawns areas during peak time (before and after lunch) (Figure 5-38 & Figure 5-39). Residents who do not get the pergola seats are crammed into the tree shade at the central patio.

There is no space solitary contemplation or two-person gathering (Figure 5-40 & Figure 5-41). To create a more private space, family members would drag chairs to a quiet corner. There is no transitional area like a roofed porch allowing residents who are sensitive to sunlight to enjoy outdoor views.

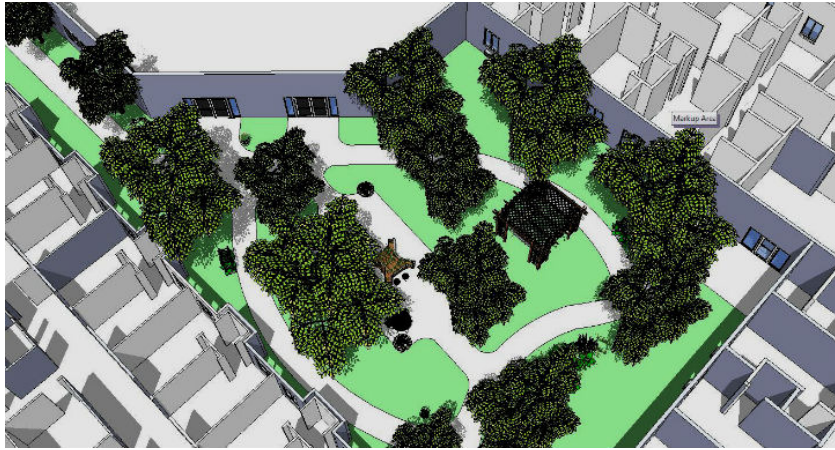


Figure 5-38. Simulating the courtyard at Elderly Living with sunlight at 11:00 am

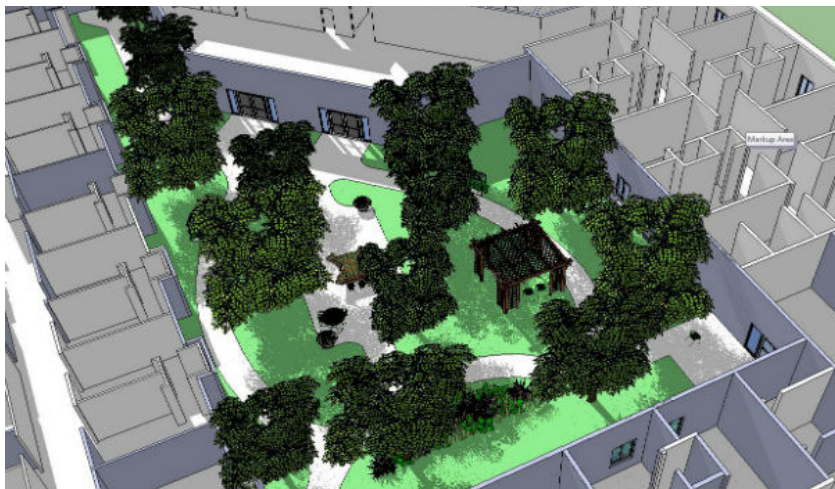


Figure 5-39. Simulating the courtyard at Elderly Living with sunlight at 1:00 pm



Figure 5-40. Simulating a close-up view of the courtyard at Elderly Living with sunlight at 1:00 pm



Figure 5-41. Simulating a close-up view of the central patio at Elderly Living with sunlight at 1:00 pm

3) Depth and density

The spatial courtyard is characterized by a wide depth and high square footage per bed for secured outdoor space. However, activity (patio) areas are insufficient, falling shy than Connecticut's requirement (Table 5-24).

Table 5-24. Comparison of Elderly Living's square footage per bed for outdoor space with state-level

Density \ Area		Elderly Living	Wisconsin	Massachusetts	Connecticut
Outdoor density	Square footage per bed for overall outdoor space	296.6	15	n/a	100
	Square footage per bed for courtyard space	75	n/a	25	n/a
	Square footage per bed for activity (patio) space	8.51	n/a	n/a	10
Avg. density in use of the courtyard*	Square footage per person for overall courtyard	4,694	n/a	n/a	n/a
	Square footage per person for activity (patio) area	531.3	n/a	n/a	n/a
Max. density in use of the courtyard**	Square footage per person for overall courtyard	724.7	n/a	n/a	n/a
	Square footage per person for activity (patio) area	82	n/a	n/a	n/a

*Space divided by **Avg. # of person** per half-hour interval snapshot-observation

Space divided by **Max. # of person in a half-hour interval snapshot-observation

In terms of depth, there is at least 80-foot deep outdoor space in front of bedroom windows at Corridor B, C and D. Some bedrooms at Corridor D with windows facing walls of the dining room have about 20 feet of clear outdoor space, which meets a minimum requirement specified in Minnesota and Alabama. The facility ensures 296.6 square feet per bed for overall outdoor space. The scale is more than Wisconsin's and Connecticut's requirement. The courtyard itself allows 75 square feet per bed for secured outdoor space, which exceeds Massachusetts's standard. The courtyard's three patios provide 8.51 square feet per bed for outdoor activities, which falls behind with Connecticut's guideline.

During the observation period, there was an average of 2.5 residents and a maximum of 14 residents per half-hour in the courtyard. Each of the user shares very spacious outdoor space (Table 5-24).

2. Sensory properties

The courtyard's sensory properties are discussed from five perspectives: 1) color selection, 2) level of sounds, 3) materials with a tactile quality of surface, 4) olfactory resources and 5) garden-grown food. In general, the courtyard provides some positive visual and tactile experiences but there is disturbing auditory stimulation occasionally.

1) Color selection

Digital images

Thirteen pictures (Figure 5-42) are selected for color analysis. They comprise images of courtyard furniture, outdoor structures, architectural façade, bird feeders, crabapple trees and annual landscape plantings. Most of the pictures are shot with a longer focal length to capture key elements to understand color distribution of the overall courtyard.



Figure 5-42. Thirteen images for color analysis of the courtyard at Elderly Living

Results of color analysis

The color pallet of the courtyard is monotonous (Table 5-25). Flowering plants may add interests of the space but their effects are mitigated due to scattered plantings. Colors of furniture fail to be outstanding from backgrounds. Glaring (high brightness) which results from light reflections on the concrete pavement may be a serious issue in summer.

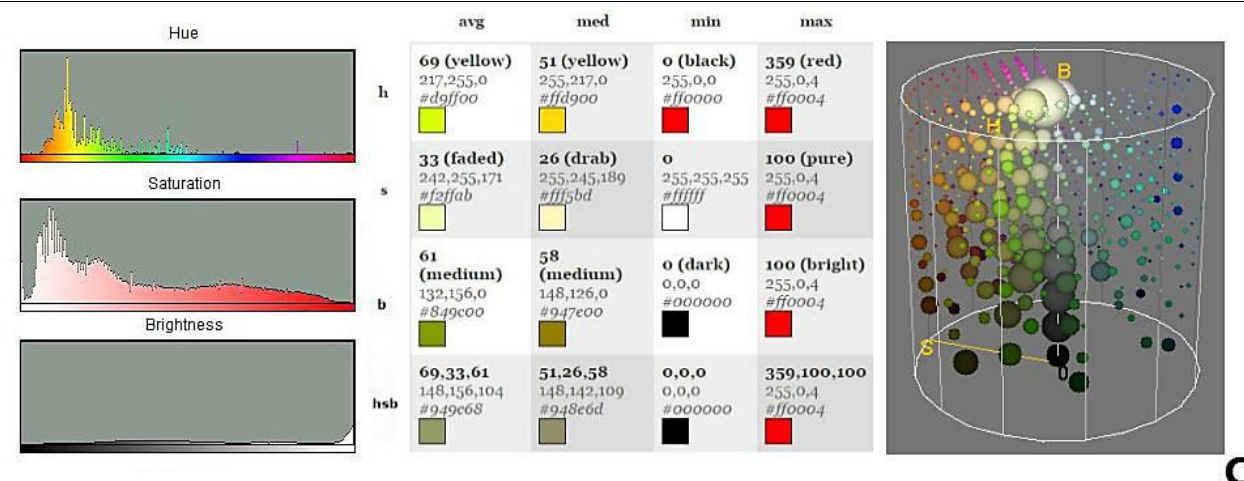
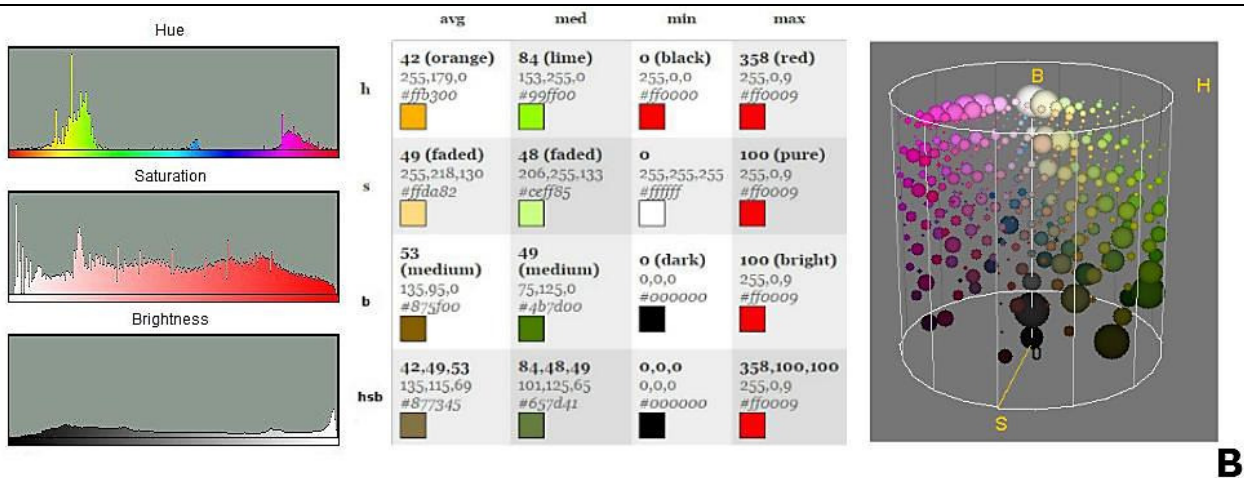
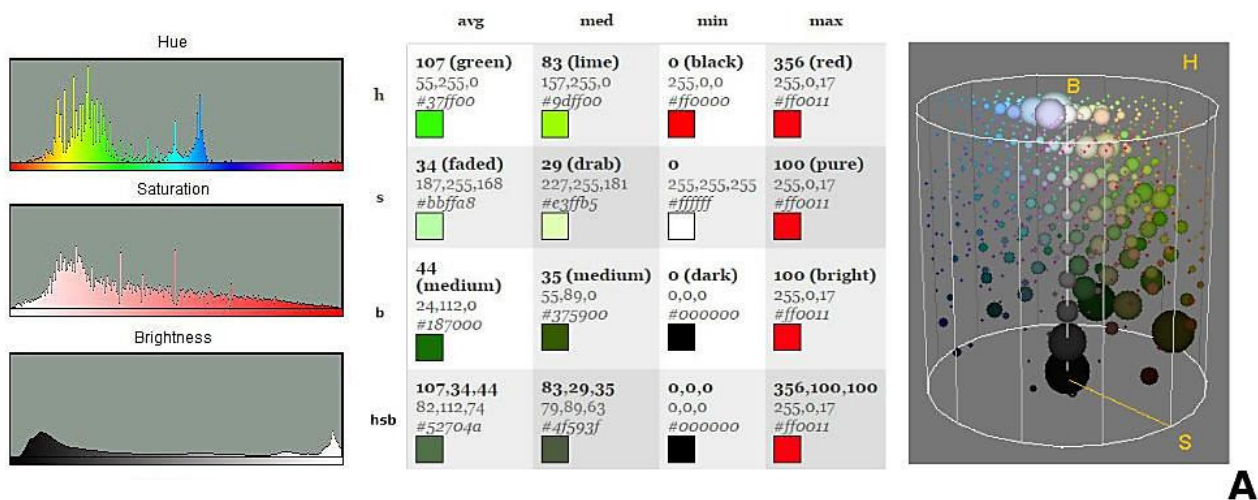
No dominant colors are found in these images. Average hue values of the 13 image ranges between orange, lime and green. Although eight images (Image A, D, F, G, H, I, J and K) show green as an average hue, their medium values are diverse. Four images (A, G, J and K) have a median hue value

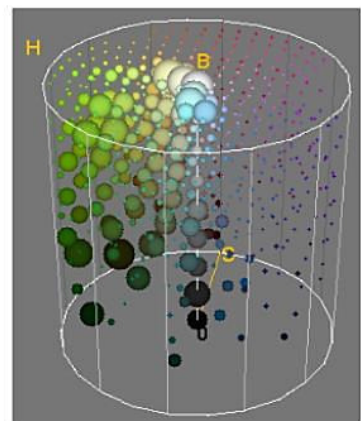
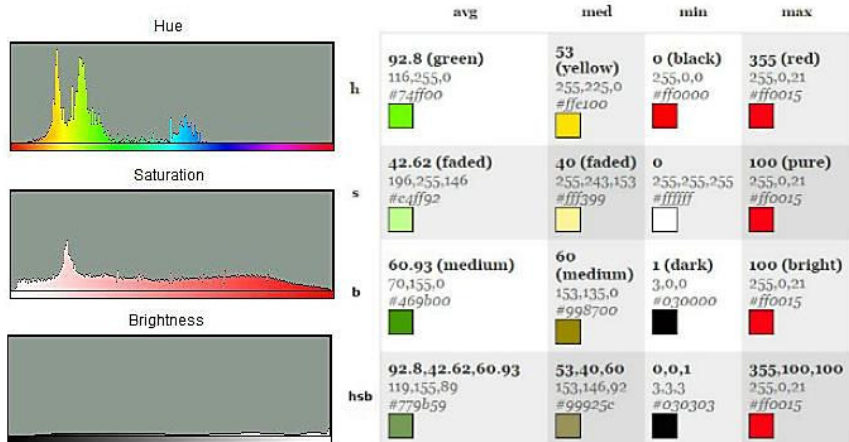
between 82° and 84° (lime), two (D & E) between 50° and 53° (yellow), two (I & M) between 48° and 49° (orange) and others between 180° (aqua) and 203° (blue). Such distribution suggests that there is no dominant color in the courtyard.

Except Image L (Stella d'Oro daylilies), all images have faded saturation on average and drab saturation in medium. A small amount of flowering plants gave no help in raising saturation of the whole environments. When previewing the courtyard from far way, residents may experience a dull landscape on average. Colors of black (e.g., 120°, 79%, 15% and 60°, 79%, 15%) appear because of the thirteen crabapple trees (e.g., Image A). They have dense, dark and wide-spreading heads and create shaded areas (darker areas) (e.g., Image A & H, Table 5-25).

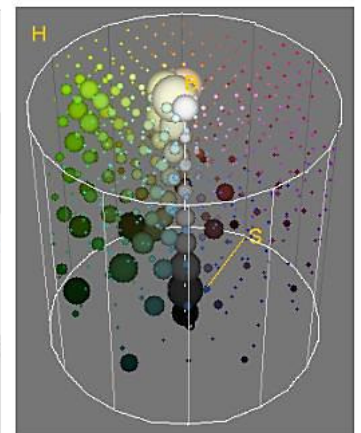
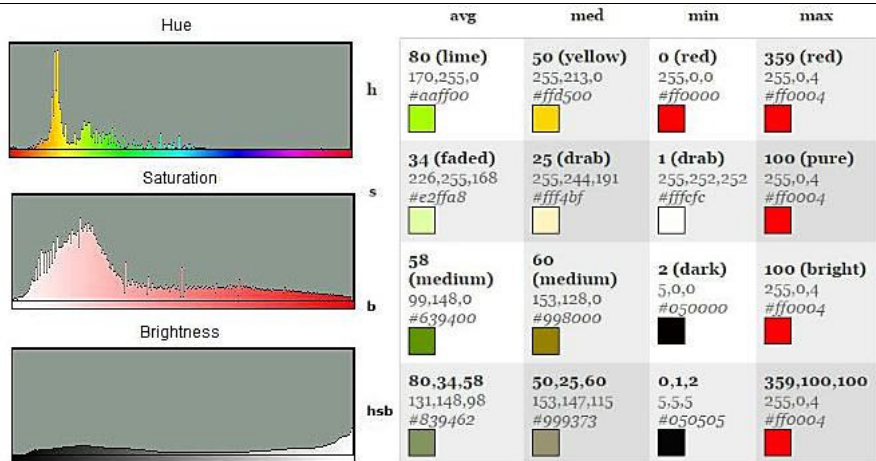
Colors of the courtyard landmarks such as the X-shaped raised bed and pergola are not outstanding from the background. The former are painted with sandy brown (40°, 73%, 97%) and peru (36°, 69%, 85%) and the latter, dark sea green (60°, 19%, 62%) and gray (60°, 47%, 50%). Colors of outdoor furniture are not salient (Image C & E). Aluminum mesh chairs and tables are painted with medium sea green and blended into a green background.

Table 5-25. Results of color analysis of the courtyard at Elderly Living

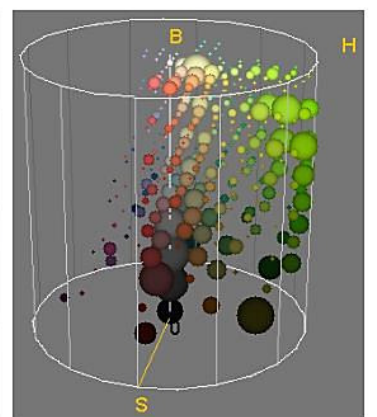
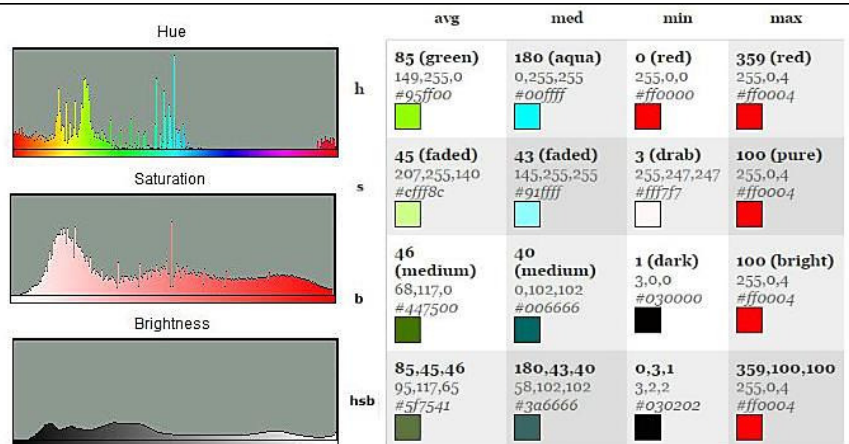




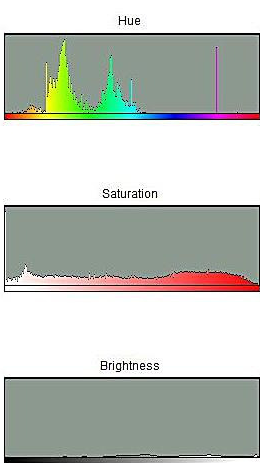
D



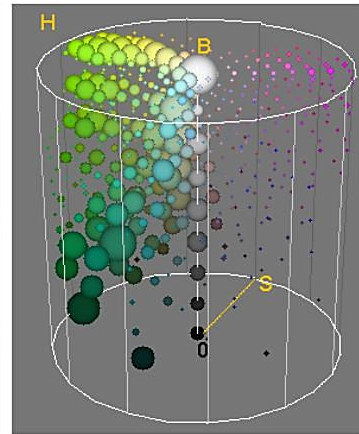
E



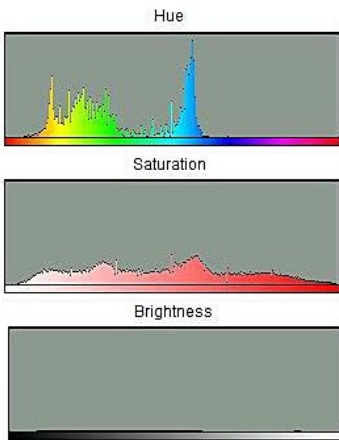
F



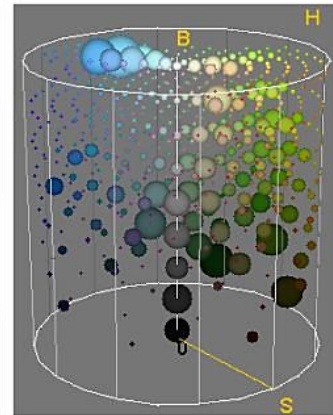
avg	med	min	max
105.58 (green) 61,255,0 #3dff00 	82 (lime) 162,255,0 #a2ff00 	0 (black) 255,0,0 #ff0000 	353 (red) 255,0,30 #ff001e 
48.6 (faded) 161,255,131 #a1ff83 	50 (faded) 208,255,128 #d0ff80 	0 255,255,255 #ffffff 	100 (pure) 255,0,30 #ff001e 
69.24 (bright) 42,177,0 #2ab100 	72 (bright) 116,184,0 #74b800 	5 (dark) 13,0,0 #0d0000 	100 (bright) 255,0,30 #ff001e 
105.58,48.6,69.24 111,177,91 #6fb15b 	82,50,72 150,184,92 #96b85c 	0,0,5 13,13,13 #0d0d0d 	353,100,100 255,0,30 #ff001e 



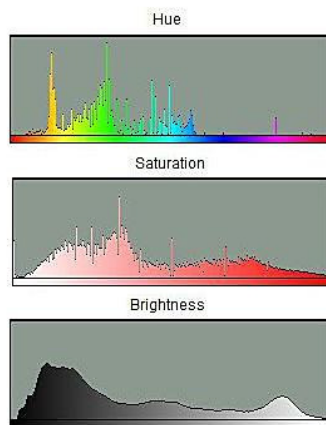
G



















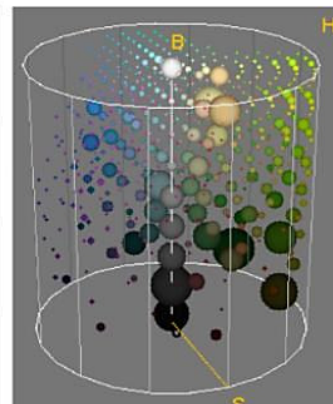
avg	med	min	max
126 (green) 0,255,26 #00ffa1 	203 (blue) 0,157,255 #009dff 	4 (red) 255,17,0 #ffa100 	348 (red) 255,0,51 #ffa033 
46 (faded) 138,255,149 #8aff95 	47 (faded) 135,209,255 #87dfff 	2 (drab) 255,250,250 #ffa1a1 	100 (pure) 255,0,51 #ffa033 
56 (medium) 0,143,14 #008foe 	49 (medium) 0,77,125 #004d7d 	1 (dark) 3,0,0 #030000 	100 (bright) 255,0,51 #ffa033 
126,46,56 77,143,84 #4d8f54 	203,47,49 66,102,125 #42667d 	4,2,1 3,3,2 #030302 	348,100,100 255,0,51 #ffa033 



H



	avg	med	min	max
108.99 (green) 47,255,0 #2fff00 	48 (orange) 255,204,0 #ffcc00 	0 (black) 255,0,0 #ff0000 	350 (red) 255,0,43 #ff002b 	
40.75 (faded) 170,255,151 #aaff97 	35 (faded) 255,237,166 #ffeda6 	0 255,255,255 #ffffff 	100 (pure) 255,0,43 #ff002b 	
38.05 (medium) 18,97,0 #126100 	30 (dark) 77,61,0 #4d3d00 	2 (dark) 5,0,0 #050000 	100 (bright) 255,0,43 #ff002b 	
108.99,40.75,38.05 65,97,57 #416139 	48,35,30 77,71,50 #4d4732 	0,0,2 5,5,5 #050505 	350,100,100 255,0,43 #ff002b 	



I





2) Level of sounds

This courtyard is not quiet. People may sometime feel annoyed by background noise.

There are three major sources providing auditory stimulation in this courtyard: 1) machine and devices, 2) traffic and 3) wild life. Sound levels were measured every half hour at the central patio. Total 109 records were created.

According to the data, an average sound level of the courtyard is 56.3 ± 4.56 dB with ranges between 51 and 80 dB. The maximum value is produced by a gasoline-grass cutter, which is operated about one hour every other week in the summer months. A mean value exclusive the grass cutter is 55.8 ± 3.18 Db. The ventilation system and other machine created unpleasant sounds ranging from 54 to 64 dB. The clamor of vehicles constantly disturbs quietness. Motorcycles produced noises with 66 dB, and ambulances gave 56 dB. Noises of airplanes can be heard every day, ranging from 53 to 84 dB.

Table 5-26. Comparison of Silver Life's sound levels with different criteria defining "quietness"

	Courtyard at Elderly Living	NIDCD's standard	EPA's recommendation
Noise level (dB)	56.3 ± 4.56	<60	<55

According to the NIDCD's criteria (National Institute on Deafness and Other Communication Disorder) (Table 5-26), this courtyard is at the limit of providing a comfortable hearing environment. Sound levels of the courtyard are sometime over 80 dB. This courtyard, from NIDCD's perspective, is uncomfortable and may cause hearing damage (Nelson et al., 2005; The National Institute for Occupational Safety and Health (NIOSH), 1998). Based on EPA's Environmental Protective Agency (EPA) limit, Elderly Living's courtyard is not a quiet place and to some extent, disturbing.

The sound levels of the courtyard may not have much difference from that of indoor settings. It is close to a sound level of dining and common areas found in Joose's (2011) and Bharathan's (Bharathan et al., 2007) study, which is over EPA's limit.

3) *Material with tactile quality of surface*

Natural materials

Landscape elements are taken care of by a landscape firm. They are provided for visual enjoyment rather than gardening activities. Although there is a raised bed with a knee space for wheelchair users at the central patio, it serves only as visual attraction or landmark.

Wind

To understand wind environments in the courtyard, wind speeds were measured using the handheld travel anemometer every half hour at the central patio during the observation period. A total of 109 records were created. An average level of wind speeds is 1.5 ± 1.7 mph with a range between 0 and 10.5 mph. The data is summarized in Table 5-27.

Table 5-27. Wind speed at the courtyard of Elderly Living (mph)

	2-July	4- July	5- July	7- July	8- July	9- July	10- July	11- July	12- July	13- July	14- July	
Max	3.5	1.9	7.2	10.5	2.6	1.7	2.6	3.2	3.2	0.8	1.1	Max=10.5; Min=0.8; Avg = 3.5
Min	0	0	0.8	0.2	0	0	0	0	0	0	0	Max=0.8; Min=0; Avg = 0.1
Avg	1.7	0.4	3.2	2.9	1.4	0.8	1.2	1.7	1.5	0.4	0.5	Overall Avg = 1.5

As shown in the table, the daily wind speed on average is less than 3.5 mph. Based on the Beaufort criteria (Table 5-8), the courtyard during the observation period can be described as “calm”.

Temperature

According to the National Weather Service (NWS) (Table 5-28) (between 10: 00 and 5:00 pm from July 2 to 14, 2013), the weather during the observation period was permitting for outdoor activities.

Table 5-28. Air temperature between July 2nd and 14th , 2013 (°F)

	2-July	4- July	5- July	7- July	8- July	9- July	10- July	11- July	12- July	13- July	14- July	
Max	68	78	83	89	87	80	80	78	78	81	84	Max=89; Min=68; Avg = 81
Min	62	74	77	81	73	68	79	73	73	79	79	Max=81; Min=62; Avg = 74
Avg	65	77	81	86	79	72	79	75	76	80	82	Overall Avg = 77

Data of the temperature measured in the courtyard is summarized in Table 5-29. It is much higher than the NWS’s report. Characteristics of the site (e.g., an urban setting, concrete pavement etc.) may cause the courtyard much warmer than the air temperature.

On average, the temperature in the sun was 90.3 degree with ranges between 104 and 68 degree. The temperature in the shade was 79.3 degree with ranges between 92 and 67 degree. There were five days over or close to 100 degree in the afternoon. The courtyard in these days did not close; residents still had access to it.

Table 5-29. Temperature measured at the courtyard of Elderly Living

	2-July		4- July		5- July		7- July		8- July		9- July		10- July		11- July	
	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun
Max	72	88	83	92	87	95	92	101	89	104	78	80	86	100	80	95
Min	67	80	76	82	80	81	82	84	81	81	68	68	70	80	75	88
Avg	70	83	79	88	82	89	86	94	88	91	75	76	81	92	77	92

	12- July		13- July		14- July					
	Shade	Sun	Shade	Sun	Shade	Sun	Shade	Sun		
Max	78	96	81	99	83	104	Max=92 ;Min=72; Avg = 83		Max=104 ;Min=80; Avg =96	
Min	72	80	78	93	81	98	Max=82 ;Min=67; Avg =75		Max=98 ;Min=68; Avg = 83	
Avg	75	89	80	94	82	99	Overall Avg = 79.3		Overall Avg =90.3	

Compared with state-level requirement of indoor temperature (Table 5-30), the outdoor temperature during the observation period was acceptable in the shade but approaching the limit defined in the Arkansas codes. Staying in the courtyard with the direct sunlight should be very dangerous.

Table 5-30. Comparison of Elderly Living's temperature with state-level requirement of thermal comfort

Measured courtyard temperature at			Wisconsin	Arizona	Arkansas
Elderly Living in summer					
	shade	sun			
Temperature (°F)	79.3	90.3	72 (Min.)	71 (Min.) 84 (Max.)	75 (Min.) in winter 80 (Max.) in summer

4) Olfactory resource and garden-grown food

There is a lack of olfactory and taste stimulation during the observation period. Most of vegetation is landscaped for visual appreciation. One exception is a patch of Stella D'Oro daylilies with very slight fragrance; however, these plants are grown at a place that is not reachable. People are hardly to experience the aroma. The experience of olfactory stimulation may be more evident in spring when the thirteen crabapple trees bloom.

3. Building-system properties: built & human-made features

This courtyard has many built and human-made features (Table 5-31) but some of them are not fully utilized. These features can be divided into five groups: 1) wheelchair friendly features, 2) weather protection, 3) outdoor furniture, 4) animal and plant supplies and 5) information device. A wheelchair automatic door, raised bed and one-level concrete pavement provide easy access to the courtyard and plants. The automatic door is installed at the north entry, standing between a resident lounge with a uncover entry patio. The other four entrances have push-pull doors, not very friendly to wheelchaired residents. Since no sign guide residents to the automatic door, residents (especially residents with cognitive impairments) often chose an exit near their room. Some residents were stuck by a threshold or by trying to grab a door handle and backup at the same time.

A X-shaped raised bed is placed at the central patio. It leaves 28 inch beneath the bed for a knee space and allows several persons gardening at the same time. However, very few gardening activities were planned, and spontaneous gardening was not encouraged. As a result, the raised bed is mainly for visual interest. A comfortable, one-level walking loop, encourages walking; it has been used by physical therapies to improve residents' strength and evaluate their physical movement. One issue is there is no bench or chairs set along the path for a short break.

A pergola enclosed by trellis with climbing plants is the only shading structure giving protection from the weather. It is very popular because of the shade and a sense of enclosure the structure provides. According to the observation, the pergola was always occupied; others who failed to get the spot returned to the building or waited under tree shade until it is available.

There is only one birdfeeder (a birdfeeder pole) that is more durable. It was brought by a resident, who used to enjoy bird-watching at home. Other birdfeeders were made of foam cups by staff and residents. They have been collapsed due to exposure to the sun and rain.

Table 5-31. Built & human-made elements in the courtyard of Elderly Living

	Category	Description	Purpose
Wheelchair friendly feature	Automatic door opener	It is installed only at the north entrance.	<ul style="list-style-type: none"> • Providing easy access to the courtyard and to plants
	Raised bed	A 35-inch-height-X-shaped table planter	
	Concrete pavement		<ul style="list-style-type: none"> • Providing easy navigation
Weather protection	Pergola	Size: 126"Lx128"Wx85"H	<ul style="list-style-type: none"> • Allowing residents to adjust a local climatic condition
Outdoor furniture	Outdoor furniture	Three movable aluminum mesh tables and seven mesh chairs	<ul style="list-style-type: none"> • Providing seating space for ambulatory residents and family members • Giving flexibility to move the furniture based on needs of activities
Animal and plant supplies	bird feeders	One bird feeder pole resident brought from home stands close to the pathway. Several foam-cup bird feeders made by activity staff and residents hang from the branches of trees.	<ul style="list-style-type: none"> • Adding wildlife interests
	Container/ Container trellis	Container size: 50"Lx30"Wx18"H; Trellis size: 50"Lx30"Wx40"H(No plants climbing on trellis)	<ul style="list-style-type: none"> • Making plants more visible by adding vertical variation to the courtyard
Information device	Thermal meter		<ul style="list-style-type: none"> • Providing information of outdoor temperature
Water feature	n/a	n/a	n/a
Emergency communication device	n/a	n/a	n/a

C. Support of experience attributes

The results of the auditing evaluation are illustrated in Figure 5-43. The director's assessment in most of the dimensions is consistent with what the researcher reads. A mean score of the director's rating is 2.72. "Privacy" got a highest score (mean=4), followed by "social interactions" (mean=3.14) and "safety & security" (mean=2.83). Except "Sense of ownership" (mean=1.80) and "Awareness & orientation" (mean=2.36), all dimensions score above 2.50.

From the staff's perspective, the supportiveness falls between "fair" and "good". The courtyard satisfies the needs of creating an intimate feel and accommodates spontaneous social interactions; however, the support of group events is inadequate due to a shortage of seating or gathering space. The dimension of accessibility is not standing out. Inaccessible entrances, garden features and narrow walking paths may have impeded outdoor usage.

From the researcher's perspective, there is lacking in privacy and multiple-sensory stimulation. Except the pergola, no place provides senses of enclosure. Sensory stimulation in the courtyard is monotonous. The views of perennials are over-emphasized; few opportunities are set up for gardening activities. One advantage of having a "passive-use" scheme is to ensure safety and security. In this courtyard, worries of outdoor residents being at risk could be fueled by the architecture layout creating difficulty of surveillance from the inside. Therefore, sedative activities that require fewer surveillance efforts may be preferred.

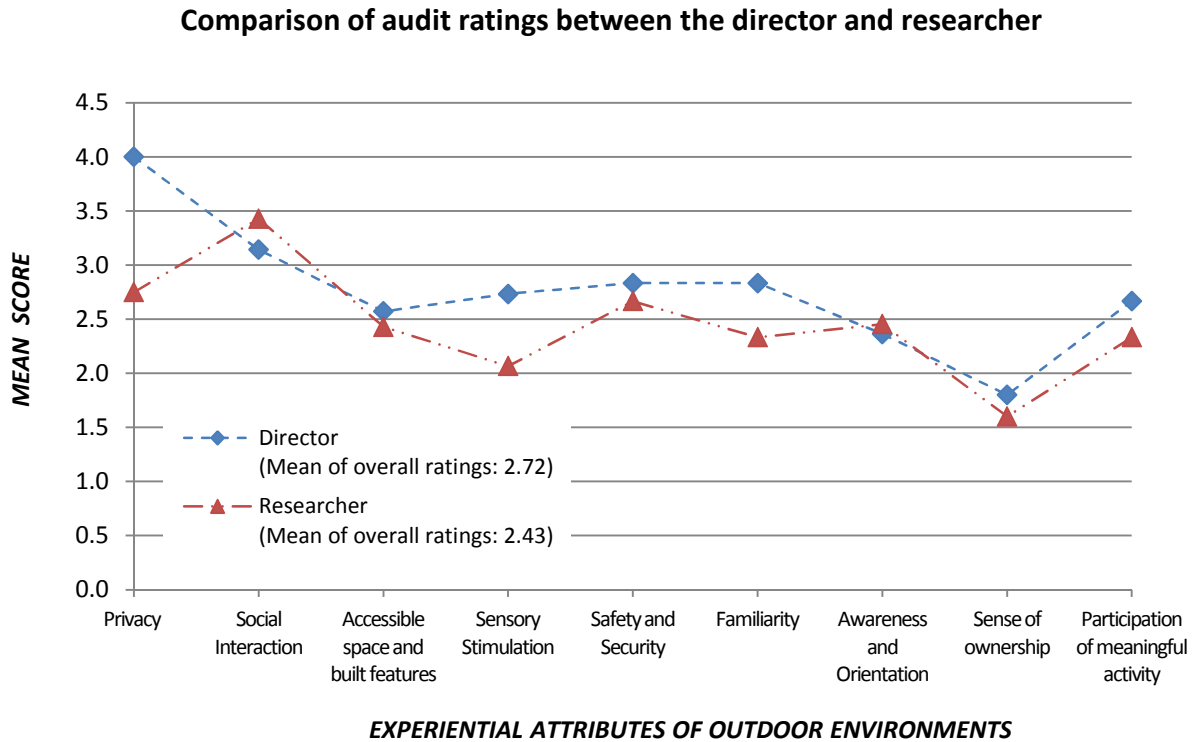


Figure 5-43. Result of assessing physical environments of the courtyard at Elderly Living

V. Comparison of Physical Settings

1. Facility buildings

Features of the three facility buildings are summarized in Table 5-32. They are similar in location, date of completion (all are period-C facility with plans approved after 1974) and story levels. One feature to differentiate the three cases is building exterior; Silver Life's ranch-style design creates a residential feel; the others give a more restrained and institutional atmosphere. Silver Life and Golden Age have a single building housing both long-term and short-term residents; they have a typical double-loaded plan enclosing a courtyard. Elderly Living is a complex of two jointed buildings; one with enclosed courtyard space houses long-term care residents.

NodeXL analysis suggests Silver Life and Golden Age both have a centralized layout, in which most of caring and social spaces are connected with one corridor, and residents are required to walk a long distance (ranging from 100 to 300 feet) to the corridor for a meal or activity participation. Their similarity is reflected in centrality metrics (average value of degree, betweenness centrality, closeness centrality, eigenvector centrality and lustering coefficient), and in overall metrics (number of total edges, maximum geodesic distance between two locations, geodesic distance from a main entry (spatial depth) and graph density).

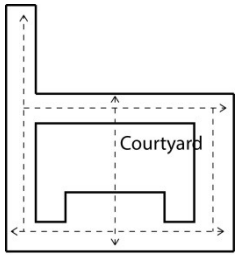
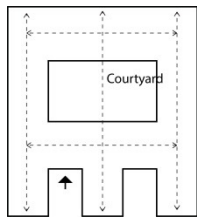
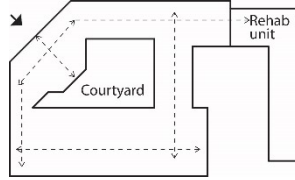
Elderly Living has a “duo-core” layout; it has two nodes with a relatively higher number of degree and centrality metrics. Each of the two nodes serves as a center of a spatial clusters, which has its own independent resource (e.g., caring service and lounge space) but also share some facilities (e.g., activity and dining room) with the other one. The duo-core structure creates a more complicated spatial relationship than a centralized one, which leads to a higher number of total edges and a higher value of average geodesic distance, degree, betweenness centrality and clustering coefficient. However, the complexity makes its layout less compact; its closeness, eigenvector centrality and graph density is the lowest among the three cases; in other words, many detached places are created.

The layout of Elderly Living may impose much more environmental press on residents; people who have cognitive impairment may have problems of wayfinding while walking across spatial clusters. It may also demand a lot of physical effort when using shared facilities. For example, there is only one activity room in the facility; some residents have to travel over 300 feet to participate in an event.

In terms of types of social space, Silver Life offers more diverse choices with different levels of privacy. On the contrary, the others two cases provide large-group social space, which is commonly found in a traditional nursing home. In terms of square footage of social space per bed, Elderly Living has the most generous size and Golden Age has the least but they all outperform Wisconsin’s requirement (25 square feet per bed, inclusive of dining space). However, compared with a recent trend

that requires 35 square feet per bed exclusive of dining space (Cutler et al., 2008), the three facilities are falling behind.

Table 5-32. Comparison of facility buildings among the three cases

	Silver Life	Golden Age	Elderly Living
Location	A city 15 miles west from downtown Milwaukee	North of City of Milwaukee; 12 miles from downtown Milwaukee	City of South Milwaukee; 11.8 miles from the downtown Milwaukee
Date of building completion	1993	1996	1988
Building Area (ft ²)	50,000	27,000	Long-term unit: 40,610 Short-term unit: 23,986
Story	One	One	One
Exterior	A residential feel creating by ranch-style exterior — mansard roofs with gray shingles, red-brick walls with picture windows framed by white grid patterns	Very subdued appearance characterized by tan brick and white garble end walls as well as olive green roofs	An institutional feel characterized by blue-gray stone and brick walls with aluminum window frames, and a flat roof design with blue parapets
# of beds (b)/residents (r)	110 (b)/96 (r)	81 (b)/60 (r)	135 (b)/124 (r)
Architecture layout	Double-loaded corridors looping a rectangular courtyard	Three parallel outstanding wings growing from circular double-loaded corridors with a rectangular courtyard at the center	Long-term unit: Double-loaded corridors surrounding a trapezoid-shaped courtyard
			
Indoor social space & size (ft ²)	Activity alcove (108) Activity room (787.5) Library/chapel (315) Dining room (2000) Day room 1 (6.8) Day room 2 (870) Waiting lounge (525) Family private meeting room (286)	Living room (430) Main dining/activity room (2205.7) Secondary dining room (500) TV lounge (516.7)	Waiting lounge (221) Resident lounge 1 (660) Resident lounge 2 (683.5) Activity room (910) Dining room (2826)
Social space per resident	44.5	45	70 (long-term unit)

(include dining room)			
Social space per resident (exclude dining room)	26.3	11.6	28 (long-term unit)
NodeXL Analysis			
Spatial characteristics	Centralized layout; Simple spatial relationship Long-walking distance	Centralized layout; Simple spatial relationship Disconnected space; Long-walking distance	Duo-cores structure; Complicated spatial relationships; Disconnected space; Long-walking distance
Center of the spatial network	Corridor A (with degree of 13)	Corridor A (with degree of 11)	Corridor A (with degree of 8) Corridor D (with degree of 11)
Total Edges	34	35	47
Max. Geo. Distance between Locations	6	6	7
Max. Geo. Distance from Main Entry	5	5	5
Avg. Geo. Distance	2.857778	2.936524	3.259313
Avg. Degree	2.267	2.258	2.432
Avg. Betweenness Centrality	28.367	30.516	42.297
Avg. Closeness Centrality	0.012	0.011	0.009
Avg. Eigenvector Centrality	0.033	0.032	0.027
Avg. Clustering Coefficient	0.040	0.035	0.057
Graph Density	0.07816092	0.075268817	0.067567568

2. Physical settings of the three courtyards

1) Spatial properties

Spatial properties of the three cases in terms of indoor-outdoor relations, spatial arrangement and square footage of outdoor space are summarized in Table 5-33.

Indoor-outdoor relations:

In terms of physical connection with indoor space, traveling to the three courtyards from resident rooms demands a great amount of mental and physical efforts. In terms of visual connection, Silver Life's courtyard is more visible from both indoor private and public space while the other courtyards provide little visual access from indoor public areas.

The three courtyards have a high spatial depth; they are located at least four geodesic distances from a main entry area. Such spatial depth makes residents walk through at least three places (points) such as a receptionist office before wandering out. Residents may experience some challenges in traveling from their rooms to the courtyards. Especially in Silver Life and Elderly Living, long walk distance increases difficulty levels.

Direct connection with indoor activity spaces varies in the three courtyards. Golden Age allows physical access from the dining/activity space; the connection allows staff to utilize both indoor and outdoor resource in a flexible way. In Silver Life, its activity room is segregated from the courtyard. In Elderly Living, although there is immediate access from dining and lounge space, its activity room that holds major indoor activities is not in close proximity.

Silver Life offers the highest level of visual access; residents are able to observe outdoor activities from different private or public spaces. The only thing lacking is no visual access from activity staff's office; staff can hardly monitor the courtyard while carrying out tasks. On the contrary, in Golden Age, there is a lot of visual access from staff's work places (offices of kitchen staff, administrator, nursing director and activity director) but little from indoor public or social space. In Elderly Living, the amount of courtyard's visibility is provided somewhere between the other two. A nursing station has a partial view of the outdoors, and residents are able to observe the outdoors in lounge and dining space. One limitation is that residents have to walk a long distance to get to these spaces.

Spatial arrangement of the courtyard

Silver Life and Golden Age have a relatively simple layout; the former has patio space sandwiched by two grass areas and the latter is divided into two-equally sized grass and patio space. The simplicity facilitates wayfinding and orientation but may cause some issues; first, activities are centralized within patio space; courtyard users may not feel secluded from public attention if there is no appropriate visual screen. Another issue is there is no clear boundary to define activity sections in one-

piece hard surface; in both cases, people may feel confused or act inappropriately when they mix up walkway and gathering space. Inappropriate behavior can be easily triggered in Golden Age; an incomplete path leading residents to a dead end. Research has found that a dead end may frustrate wanderers and cause agitated behavior (Cohen-Mansfield & Werner, 1998a; Randall et al., 1990).

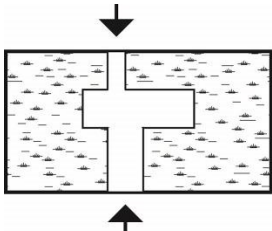
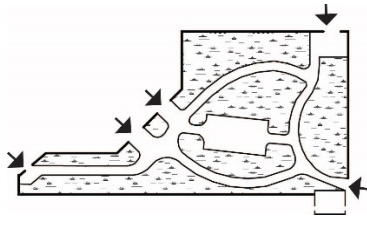
On the contrary, Elderly Living has a more complicated spatial arrangement with a figure-8-shaped path at the center and multiple exits/entries. The complexity often makes residents with cognitive impairment not leave by the same door they enter. Furthermore, these exits lead residents to different corridors; once they enter buildings, staff would have to wheelchair them back to where they set off from.

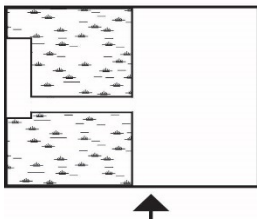
A variety of seating space is arranged in Silver Life; it did give many choices of group social areas in the shade and sun but offers little private seating space. Fewer varieties are provided in the other two cases; most of them are public seats in the sun or shade of trees. In Elderly Living, people compete for shady spots (especially for seats in a pergola) before and after lunch time.

Square footage of outdoor space per resident

The three facilities have both enclosed outdoor space (a courtyard) and outdoor space adjacent to their building. Their square footage per bed for overall outdoor space outperforms Wisconsin's (15 ft² per bed for outdoor space) and Connecticut's (100 ft² per bed for outdoor space) standard. Since the three facilities disallow free access to unsecured outdoor space, it is more realistic to understand density of the courtyard space. Silver Life provides the most spacious courtyard space for each resident, followed by Elderly Living and Golden Age. They all supersede Massachusetts's requirement (25 ft² per bed for enclosed outdoor space). Connecticut requires 10 square feet as a minimum of square footage per bed for outdoor activity areas (patio or porch space). Silver Life and Golden Age exceeded in that but Elderly Living falls shy.

Table 5-33. Comparison of spatial properties among the three cases

	Silver Life	Golden Age	Elderly Living
Indoor-outdoor relations			
▪ <i>Courtyard's physical connection with other indoor spaces (Geodesic distance @ Physical distance (ft.))</i>			
Entry	5@68 ft.	4@ 107 ft.	4@ 88 ft.
Resident corridors	3@168 to 233 ft.	3@ 99 to 163 ft.	2@ 43 to 143 ft.
	2@17 to 162 ft.	2@43 to 80 ft.	2@29 to 67 ft.
	3@177 to 241 ft.	3@100 to 147 ft.	3@ 61 to 133 ft.
Activity room	3 @ 61 ft.		4 @ 119 ft.
Dining room	3 @ 55 ft.	1 @ 0 ft.	1 @ 0 ft.
Resident lounge/	3 @ 90 ft.		1 @ 0 ft.
Day room	3 @ 151 ft.	3 @ 135 ft.	5 @ 62 ft.
▪ <i>Visibility analysis</i>			
Space with visual access to the courtyard	Corridors		
	Resident rooms	Corridors	Corridors (with very narrow angle views)
	OT/PT room	Resident rooms	Resident rooms
	Family private dining room	Dining room	Resident lounge
	Activity alcove	Kitchen	Nursing station (with very narrow angle views)
	Chapel	Staff offices (activity staff, administration and nursing director)	Dining room
	Activity room		
	Day room		
	8	5	5
Spatial arrangement of the courtyard			
Courtyard layout	Simple, readable but over-exposed and undifferentiated	Simple, confusing, over-exposed and undifferentiated	Simple in layout but complicated in multiple exits/entries
	A "sandwich" layout— a patio serving as a path at the center between two pieces of grass areas	A "half-half" layout, in which the whole area is divided into two equal-sized pieces: a paved patio and a grassy land	A figure-8-shaped path at the center stretching to five exits.
<div style="display: flex; justify-content: space-around; align-items: center;">   </div>			

			
Exit/Entry	Two easy, accessible and recognizable entries/exits	Two recognizable but not wheelchair friendly entries/exits	No main and secondary distinction between doors; No landmark guiding to the only one automatic door; No sign indicating which corridor is next to the exits/entries
Variety of seating space	<ul style="list-style-type: none"> Public space 1) in the sun, 2) in tree shade, 3) under umbrella tables, 4) in a tent; and 5) in a porch (indoor-outdoor transition) 	<ul style="list-style-type: none"> Public space 1) in the sun and 2) in tree shade 	<ul style="list-style-type: none"> Public space 1) in the sun and 2) in tree shade Semi-private space 1) in a pergola
	5 types	2 types	3 types
Square footage of outdoor space per resident			
Overall outdoor space	489.7	257.6	296.6*
Courtyard	143	61	75*
Secured outdoor activity (paved) area	22.7	27.6	8.51*

* square footage of outdoor space in the long-term care units

2) Sensory properties

Silver Life's courtyard provides more quality sensory stimulation (Table 5-34). It was characterized by a variety of colors with higher saturation; plants and furniture play an important role in adding visual interests. It was quieter on average during the observation period; less disturbing noise of machine and vehicles was found. Tree, flowering plants, vegetables and herbs are sources of textile, olfactory and tasting experience. Golden Age and Elderly Living are lacking in variety and quality sensory experience. The former is filled with cigarette smell and the latter is characterized by sound levels over

the EPA's (Environmental Protection Agency) and NIDCD's (National Institute on Deafness and Other Communication) requirements.

Air and thermal environments also gave stimulation. In the three cases, it was very risky to stay in the sun before and after lunch time during the observation periods, but the shade of trees or structures helps cool down the air; it prevents the body from overheating and allows longer outdoor enjoyment.

Table 5-34. Comparison of sensory properties among the three cases

	Silver Life	Golden Age	Elderly Living
Visual stimulation (color selection)			
Hue	Red, orange, yellow, lime, green, blue and purple	Orange, yellow, lime, green and blue	Orange, yellow, lime, aqua and blue
Saturation	Rich to faded	Faded	Faded to drab
Brightness	Medium	Medium	Medium
Auditory stimulation			
Level of sounds	52.59 ± 2.65dB	53.88 ± 3.80dB	56.3 ± 4.56 dB
Auditory comfort	Quiet	Quiet; Clamor of vehicles sometime over EPA's standard (55dB)	Not too quiet Clamor of vehicles and mechanic operation sometime over EPA's (55dB) and NIDCD's standard (60dB)
Tactile stimulation during the observation period			
Natural material	Some	Few	Scanty
Wind speeds on average	2.97±2.07	3.11± 2.04 mph	1.5 ± 1.7 mph
Beaufort wind criteria	Calm to light air	Calm to light air	Calm
Temperature on average (Shad/Sun)	77.1 / 87 °F	79.3 / 88 °F	79.3 / 90.3 °F
Thermal comfort based on state requirements in Arkansas and Arizona	Risk to stay in the sun	Risk to stay in the sun	Risk to stay in the sun
Olfactory and taste stimulation			
Level	Light to medium	Heavy	light
Source	Lilac bushes Moonflowers Chives	Cigarette smell	Crabapple trees in spring

3) *Building-system properties: built & human-made elements*

As shown in Table 5-35, Silver Life has the most abundant built and human-made resources, followed by Elderly Living and Golden Age. Silver Life’s courtyard contains wheelchair-accessible features, different shading device and structures, multiple options of outdoor furniture and a numerous collection of birdfeeders. These features facilitate access to the courtyard, social gathering and visual appreciation of nature, maximizing passive interactions with outdoor space. One thing that is lacking on the site is a gardening setting that provides raised planting area and prosthetic gardening tool. Elderly Living slightly falls behind with shading device, outdoor furniture and culture artifacts but is seriously lacking in “fun” features; for example, no bird feed hangs outside of resident windows, and no BBQ griller is allowed.

Golden Age’s built & human-made resources are very scanty in any aspect, but the courtyard has a unique feature—a pond with a water spray—to create quality auditory experience. However, it was often turn off due to a maintenance issue. Four ashtray stands and countless cigarette butts on the ground suggest the courtyard is where smoking is permitted. Plastic chairs were the major sitting furniture; aluminum mesh furniture that is more stable and commonly found in the other two cases is absent in Golden Age.

Table 5-35. Comparison of built & human-made elements among the three cases

	Silver Life	Golden Age	Elderly Living
Overall evaluation	A great amount of resources to enhance multiple outdoor experience	A lack of resources and of maintenance;	Adequate resource but careless planning
Wheelchair friendly features			
Types & number	Two wheelchair automatic doors A one-level concrete path	One wheelchair automatic door	One wheelchair automatic door A one-level concrete path One raised bed
Total # of features	3	1	3
Weather protection			
Types & number	A porch	n/a	A pergola

	A tent		
	Four umbrella tables		
Total # of features	6	0	1
Outdoor Furniture			
Types & number	Four movable aluminum mesh umbrella tables; Eight mesh chair; Three plastic chairs; Two rocking chairs; Two wicker chairs; One wicker table; One cabinet BBQ grill	One movable aluminum mesh tables; Six plastic chairs One lounge chair One BBQ grill Four ashtray stands	Three movable aluminum mesh tables Seven mesh chairs Two mesh benches with cushion Two coffee tables One plastic chair with metal frames One hat/cushion storage cabinet One drinking water container
Total # of features	22	13	17
Animal & plant supplies			
Types & number	More than 20 birdfeeders One birdbath 15 containers	Three birdfeeders One wall trellis	One birdfeeder pole; Two square metal mesh birdfeeders; Four container trellises; Six planters
Total # of features	>36	4	13
Cultural symbols			
Types & number	One flag One wheelbarrow One wood wheel Two pinwheels	One sculpture One butterfly decoration	n/a
Total # of features	5	2	0
Information device			
Types & number	n/a	One thermal meter	One thermal meter
Total # of features	0	1	1
Water features			
Types & number	n/a	A small pond with a water spray	n/a
Total # of features	0	1	0
<i>Sum</i>	>72	17	35
<i>Inadequacy</i>	No raised bed or planter for wheelchair gardening; No prosthetic tool for gardening	No raised bed or planter for wheelchair gardening; Bumping pavement; A sliding door with a high threshold; Unsturdy plastic chairs;	Heavy pull-push doors; Walking paths disallowing two wheelchair passing by; Few shading device; No prosthetic tool for

	No shading device; No prosthetic tool for gardening	gardening
--	---	-----------

3. Support of the experience attributes

Results of the researcher's evaluation are illustrated in Figure 5-44. Silver Life on average outperforms the other two cases (mean=2.70), and Golden Age lies at the bottom (mean=1.71). Silver Life has an excellent performance in the dimension of "social interaction", "accessible space and built features" and "awareness & orientation"; its abundant furniture, and high visibility of the courtyard aid in these aspects in particular. Elderly Living also did well in the dimension of "social interaction", but other aspects are just in a medium level. Interestingly, the courtyard has almost everything that ought to be installed, but it is either insufficient (e.g., shading device) or just acts as decoration (plants and raised beds) not allowing interactions.

Golden Age was assigned a better score in "familiarity", although worst in the other dimensions. Its mess of garden space activates resident's desire to do gardening, supervise plants and provide advice; its loose management partially allows residents to do what they used to doing at home (e.g., some light modification of environments).

Overall, the three courtyards scored higher in "social interaction" and "accessible space and built features" but lower in "sense of ownership", "sensory stimulation" and "participation in meaningful activity" (Figure 5-45), which suggests the three physical settings encouraged outdoor experience related to passive activities. The passivity refers to less autonomy, personalization or individualization of space and multiple-sensory experience that may require action of changing environments. Activities like displaying artwork, labeling names on plants, placing one's furniture, participating in gardening activities, and tasting results of hard garden is hardly achieved in these courtyards.

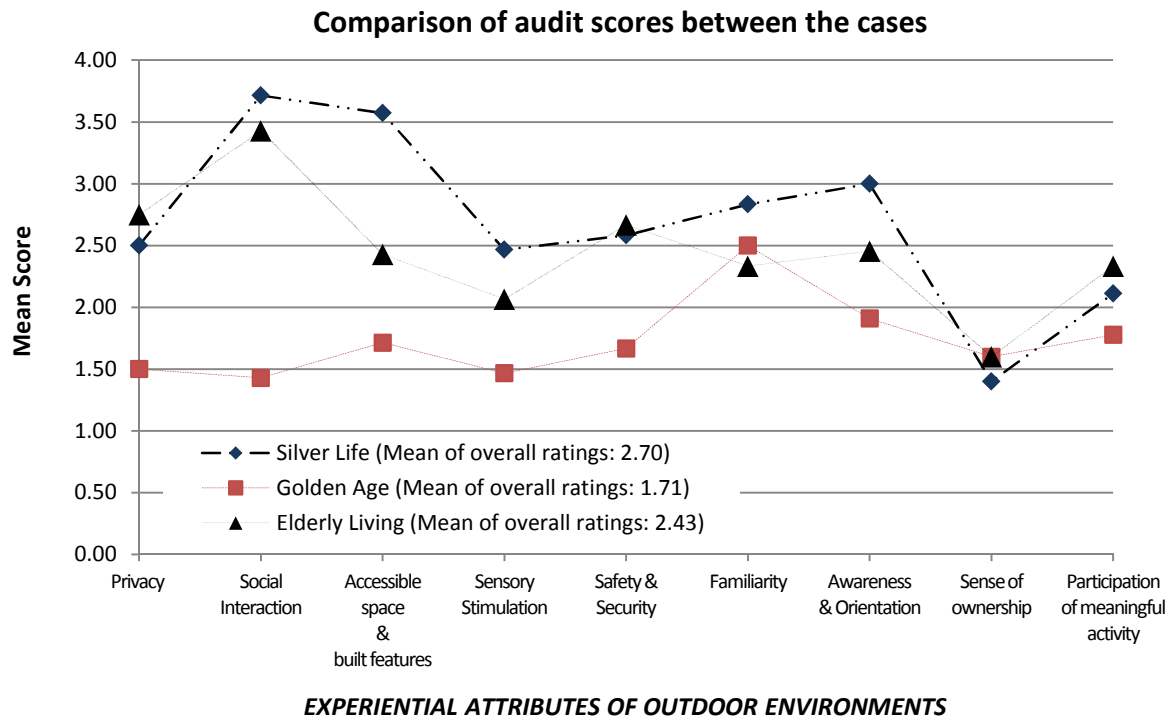


Figure 5-44. Comparison of auditing assessment among the three cases

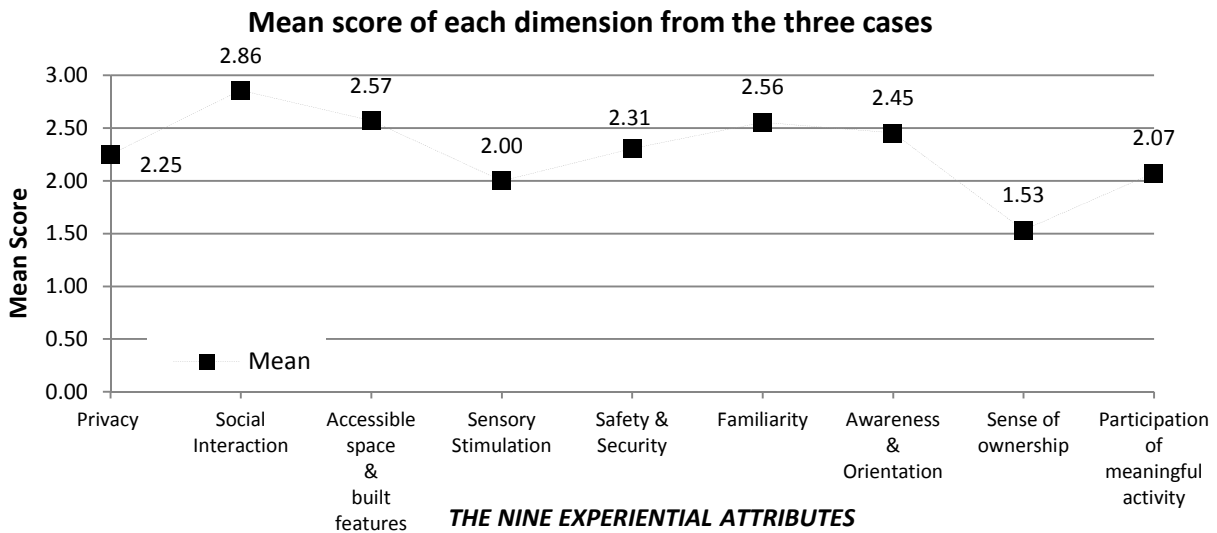


Figure 5-45. Comparison of scores among the nine experiential dimensions in the researcher's evaluation

CHAPTER 6 : PEOPLE COMPONENTS OF THE THREE NURSING HOME COURTYARDS

Following the conceptual framework proposed in Chapter 3 (Figure 3-15), Chapter 5 revealed physical environments of the three courtyards. This chapter discussed people components (organizations, staff-resident relations and residents) of the three cases. It reported data regarding consensual and subjective aspects of the courtyards and unfolded their supportiveness to the nine attributes.

Variables of organization and staff-resident relations

Key variables of the organization and staff-resident relations are derived from the studies examined in Chapter 2 (Appendix B & C). Organizational variables are divided into four groups including 1) organizational philosophy & structure, 2) outdoor activity programs, 3) outdoor policies and rules and 4) organizational resources. Variables of staff-resident relations are categorized into three groups including 1) decision-making processes, 2) roles and responsibility related to the courtyards and 3) staff training and education. These groups guide descriptions of social contexts of the three nursing homes.

Data of these variables was collected through different means. The Policy and Program Information Form (POLIF) and the Resident and Staff Information Form (RSIF) (Appendix H) were used to collect a general and quantitative understanding of facility-level information and staff resources. The former was filled out by the administrator of the three nursing homes, and the latter was provided by the activity director. Other strategies include analysis of written document (e.g., activity calendars, webpages, newsletters, etc.), staff interviews, and field notes.

Support of the experiential attributes

The Courtyard Audit Tool for Organization (CATO) (Appendix J) and Courtyard Audit Tool for Staff-Resident Interactions (CATSI) (Appendix K) were applied. These two tools help reveal characteristics of the organizations and staff-resident relations in shaping the nine attributes.

Resident profile

Residents are usually described in terms of their functioning and cognitive levels in research on institutional outdoor environments. Few address their experience, social roles and goals. In this study, descriptions of residents include objective and subjective information. The former reveals residents' demography and functioning level, and the latter uncovers their past home gardens and gardening experiences. A total of 43 residents from the three nursing homes participated in in-depth interviews. They were selected by staff based on three criteria: 1) experience of gardening, 2) English as primary language, and 3) ability of clear communication. Interviews were digitally recorded, transcribed and analyzed through content analysis (Appendix M). Several common themes of home garden/gardening experience emerged across the residents of the three cases. These themes were grouped by the nine experiential attributes. The way of categorization allows comparisons between experience of home gardens and the courtyards.

I. Silver Life Nursing Home

A. Organizational context

This section described overall organizational contexts and organizational aspects of the courtyard at Silver Life. The former described POLIF results (Moos & Lemke, 1994) and the latter introduced organizational variables related to mission & philosophy, outdoor activity programs and outdoor policies.

1. Facility's policy, care program and resources

Sliver Life is a for-profit organization owned by a small corporation. It is a licensed and certified Wisconsin nursing home, participating in both Medicare and Medicaid. Services provided in the facility include room, board, cleaning, personal care, nursing care service, therapy & rehabilitation and recreational activities. No minimum age is required for admission.

Its organizational structure is relatively flat. The administrator manages eight departments: nursing, social service, therapy, dining service, life enrichment, human resources, environmental service and business office, each of which has a director reporting to the administrator. Formal staff meetings are scheduled once a week or more. The facility runs in day shift with a nurse-resident ratio of 1:11, and an aide –resident ratio of 1:9 (Wisconsin Department of Health Services, 2013). Approximately 83 percent of full-time nurses and 35 percent of full-time aides have been employed for at least one year in 2013.

Silver Life's policies and care program is analyzed using POLIF's eight organizational dimensions. Based on the scoring formula developed by Moos & Lemke (1994), Silver Life excels at "availability of daily living assistance", "health services", "policy clarity", and "policy choice" but falls behind with "acceptance of problem behavior and resident control" (Table 6-1).

Table 6-1. Silver Life's scores of POLIF

	Expectations for functioning	Acceptance of problem behavior	Policy choice	Resident control	Policy clarity	Room privacy	Availability of health services	Availability of daily living assistance
Score	0%	18.75%	72.22%	42.28%	80%	50%	88%	100%

1) Expectations for functioning:

Silver Life accepts residents with different functional abilities. It takes residents who are unable to make one's own bed, feed themselves, bathe or dress. Depression can be tolerated, but an attempt

will be made to manage depressed behavior. Based on the POLIF's scoring formula, Silver Life has zero expectation of resident functioning⁶; no functioning limit is set for admission.

2) Acceptance of problem behavior:

Residents in Silver Life can refuse to participate in programmed activities. Some behavior is discouraged such as refusing to take prescribed medicine, refusing to take bath, or making noise; others such as being drunk, wandering around the building at night, leaving the building without letting staff know and attacking others are not accepted. If residents continue to have unacceptable behavior, they may have to move out. Based on the POLIF's scoring formula, Silver Life accepts 18.75 percent⁷ of types of problem behavior listed in the POLIF.

3) Policy choice:

The organization gives a certain degree of autonomy. For example, residents are encouraged to place their own furniture in rooms, and rearrange it. People can wash socks or underwear in their bathroom. In a specific situation or an individual condition, having a glass of wine or beer at dinner or skipping breakfast to sleep late is allowed.

Breakfast hour is more than one hour while lunch and dinner are less than one hour. No bed time or waking up time is set for residents. No curfew (a time by which all residents must be in their rooms or in the facility in the evening) is placed. Based on the POLIF's scoring formula, Silver Life provides 72.22 percent⁸ of policy choice listed in the POLIF.

4) Resident control:

Residents of Silver Life are able to execute their influence in several ways. For example, a resident council with 35 resident representatives meets once two months. A regular house meeting

⁶ A total of zero out of 11 expected functioning items are found; $0 \text{ (Total score)} \div 11 \text{ (a maximum of possible points)} \times 100 = 0\%$

⁷ A total of three out of 16 types of problem behavior are accepted; $3 \text{ (Total score)} \div 16 \text{ (a maximum of possible points)} \times 100 = 18.75\%$

⁸ A total of 13 out of 18 rules are provided; $13 \text{ (Total score)} \div 18 \text{ (a maximum of possible points after subtracting one n.a. from 19)} \times 100 = 72.22\%$

meets every other month or as needed. A bulletin board is being used by residents to announce information and communicate with other residents. Staff post rules and regulations on the board too.

Social and recreational activities are decided by staff with residents input. More specifically, staff schedule social activities, decide new activities and make rules about attendance, and residents provide feedback. The same pattern is applied to planning meal menus, meal time, visitor hours, and decoration of public areas. Residents have more power in deciding whether they like to move from one bed or room to another. On the contrary, there is little input from residents in dealing with resident complaints, rules about the use of alcohol, selection of new residents and changes in staff. In general, Silver Life provides 42.28 percent⁹ of means listed in the POLIF regarding residents' engagement.

5) Policy clarity:

Policy is communicated through different strategies at Silver. For example, the facility provides a handbook for residents and staff, and an orientation program for new residents and volunteers. A regular staff meeting and resident council serve as a platform of policy communication. Silver Life provides 80 percent¹⁰ of means listed in POLIF in this section.

6) Provision of room privacy:

More than 50 percent of residents live in a semi-private room that accommodates two residents at most. There is no individual mailbox. Each resident has a personal dresser in his or her room. Residents are allowed to close their door but disallowed to lock it. A private and closed office is used for interviewing residents, and a private family room is provided for family gathering. In this section, Silver Life provides half of the means¹¹ listed in POLIF to maintain residents' privacy.

⁹ A total of 14 out of 29 means are provided; $14 \text{ (Total score)} \div 29 \text{ (a maximum of possible points)} \times 100 = 48.28\%$

¹⁰ A total of eight out of ten means are provided; $8 \text{ (Total score)} \div 10 \text{ (a maximum of possible points)} \times 100 = 80\%$

¹¹ A total of five out of 10 privacy items are satisfied; $5 \text{ (Total score)} \div 10 \text{ (a maximum of possible points)} \times 100 = 50\%$

7) Availability of health services:

Several health services are provided at Silver Life including regular doctor and nurse hours, assistance in using prescribed medications, physical therapy, occupational therapy and psychotherapy or personal counseling. Overall, Silver Life provides 87.5 percent¹² of the services listed in POLIF.

8) Availability of daily living assistance:

Assistance in daily-living activities is well-considered. Legal advice, barber service, and assistance with banking, housekeeping, grooming, laundry, shopping and transportation are provided to cater to different needs. Each meal is provided every day. Snacks are served in the afternoon on a typical day. Silver Life provides 100 percent¹³ of availability of daily living assistance listed in POLIF.

2. Organizational aspects of the courtyard

1) Mission and philosophy

According to the administrator, the courtyard aids in residents' quality of life and thus enhances Silver Life's mission. The mission of Silver Life is "to provide the best care that encompasses all the great care including spiritual and activity aspects of it and also good food. We provide all aspects of it that somebody would want at home...A courtyard space increases residents' quality of life; they enjoy going out; they like to pick up tomatoes off vines and eat while they sit there. The courtyard space gives all those extra benefits." To the administrator, the courtyard, however, is not a basic element. It is just a good addition in maintaining well-being of individuals.

In Silver Life, evidence regarding benefits of the courtyard came from two aspects: staff's personal experience and residents' feedback. As the administrator put it, "it is all based on personal experience that we know we all enjoyed gardening. We love having flowers around, nice shrubs, and what the outdoors can provide to you. In addition, we got positive feedback from residents and family

¹² A total of seven out of eight health services are provided; $7 \text{ (Total score)} \div 8 \text{ (a maximum of possible points)} \times 100 = 87.5\%$

¹³ A total of 14 out of 14 types of assistance are provided; $14 \text{ (Total score)} \div 14 \text{ (a maximum of possible points)} \times 100 = 100\%$

members; they told us how much they enjoy it.” In other words, support of having a courtyard was founded on positive outdoor experience generated across staff, residents and family members.

The courtyard has another value to the administrator— marketing. According to her, “Garden and other outdoor space become more important. It increases a lot along with the whole cultural change. The cultural change movement or the Eden alternative really added the importance of the courtyard.” The Omnibus Budget Reconciliation Act (OBRA) of 1987 and the Eden alternative (Thomas, 1996) may have driven the facility to have an intended outdoor space; the former identifies an important role of activities in increasing residents’ quality of life, and the latter emphasize a “human habitat” setting. A nice outdoor area makes facilities more competitive because it may indicate that residents’ social, emotional, recreational and cultural needs are taken care of. She explained, “Most of the facilities want to have it just because that makes you more competitive marketing-wise. In two-mile radius from this facility, there are two other nursing homes. Technically, they can provide everything we provide but they don’t have an outdoor area that we do here.”

The courtyard space is one of the facility’s special features. Silver Life makes the courtyard part of marketing plan; pictures of the courtyard are highlighted in Silver Life’s webpage and Facebook page. These images introduce the facility as a warm and less institutional setting.

2) Outdoor activity program

In Silver Life, a variety of social activities are planned in the courtyard. Most of these activities are passive with less than minimal risk. Staff meetings discuss acuity issues, which shapes how activities are carried on every day.

Scale and operation

A typical structured activity usually involves 15 to 20 residents and lasts for 45 minutes. One to two activity staff lead the activity, and two (or three) staff transport residents. Approximate 15-minute

transporting time is reserved before and after an activity. Some CNAs may help roll residents back to their rooms. In a large event, more CNAs would help transportation.

In terms of formats and schedules of activities, the activity staff are major decision makers but residents have input. Its monthly activity calendar is delivered to residents and can also be found on the facility's website. Silver Life's summer calendars showed only four outdoor activities scheduled per month in summer. In reality, more or fewer outdoor activities could be arranged. There is no minimum amount of outdoor activities is required by the administrator in summer months.

Staff are encouraged to learn new skills and try new things in the courtyard. The facility supports them to participate in education programs related to outdoor space and leisure activities. The activity director had been in a conference held by Alzheimer's Association few years ago regarding garden design for people with dementia. However, the support does not seem to be regularly offered.

Types of activities

There are two types of structured activities hosted in the courtyard. According to the activity director, one is compatible with both indoor and outdoor settings so the courtyard is utilized as extension of the activity room. The other one take an advantage of natural resources in the courtyard, allowing residents to decorate and take care of plants. Activities in the first group tend to be passive. Activities such as outdoor game, outdoor social time, a drawing class, and music performance belong to this group. If the weather is not permitting, these activities can be moved to the indoor space. Likewise, if the weather is permitting, some indoor activities can be hosed in the courtyard. The director puts it, "We can do any group out there (courtyard). It may be written on the calendar as an indoor group but we may decide to move to the courtyard because of the weather."

The second one is a garden club that provides opportunities of digging dirt and pulling weeds on planting boxes or containers. However, gardening in Silver Life is an annual activity; no more structured gardening is planned after a planting day in May. Although "flower & vegetable gardening" is listed as

one major recreational activity in the facility's webpage, it is not regularly scheduled. The garden club is also for reminiscence. The director notes, "We talked about their background and history of growing upon the farm. They used to have victory gardens or have a small garden for themselves. In summer time, we hold groups out there and we just reminisced about anything. It is held in the courtyard because it has garden space and it is just more pleasant than sitting indoors. Sometime we use magazines to bring up the topics and start the conversations."

In summer time, there is always a large event planned in the courtyard for all residents, family members and staff. On that special day, the courtyard is decorated with a tent, an arbor, outdoor bar, flower baskets, flags and a stage; musicians are invited to perform on instruments, and food is prepared at the courtyard. Staff (not only activity staff) was in full party apparel to serve food. The life enrichment department takes charges of the event. Staff would take several weeks to plan and coordinate with other departments. There is always a theme for the event. It was 1950's sox-hop party in 2012, followed by Mexican Fiesta celebration in 2013 and an anniversary party of the facility in 2014. The outdoor party aims to bring fun, music, games and social interactions to residents.

Evaluation of activity programs

Evaluation of activity programs is informal and spontaneous. Staff randomly collect residents' feedback of activities. They also encourage residents in resident councils to express their opinion and comments about the programs. The assessment of the courtyard activities is gathered by summarizing residents' consensual responses afterwards. The administrator plays a less part in evaluation by only giving input along with residents' feedback.

3) Outdoor policy

According to the administrator, staff meetings review different policy and guidelines to make sure that they are up-to-date. Each of the departments creates their own policies, which can be changed

corresponding to residents' needs. The policy is thus group-decision and is more dynamic. Overall, the courtyard allows various social activities but discourages active engagement with the environments.

Availability of the courtyard

The courtyard is open 24 hours a day if the weather permits. Two automatic doors with wheelchair touch pads allow easy and free access (no alarm is set). At night, residents are discouraged to use the courtyard unless they have a companion. The door is locked with a note on it when faced with severe weather condition.

Safety

In the courtyard of Silver Life, no emergency communication system is installed, and residents are not required to wear a portable safety device either. It is heavily relied upon staff's surveillance to maintain safe and secure outdoor environments.

Active and mobile residents are encouraged to use the courtyard independently and spontaneously. They can visit the courtyard without staff's approval. No program is provided specifically for residents who are more independent (or bedridden). It is up to the staff and residents' family members to take them to the courtyard. If they make a request to use the courtyard, it will be activity staff rather than CNAs to bring residents outside. However, given limited activity staff (one activity director and three regular activity staff), a one-on-one activity is not very likely to be available all the time.

Staff serves as primary surveillance by checking outdoor residents in person. However, according to the observation, activity staff did not come outside on a regular basis. As commented by the activity director, "It is nice that we do use the courtyard as a short cut. A lot of staff go through the courtyard in summer time. There are always staff doing observations on their way to other places." High visibility of the courtyard may also reduce some workload of monitoring (see analysis of Indoor-outdoor relations of Silver Life in Chapter 5). The director puts it, "We don't need someone to stand out there. I

can just look out the window and see people out there. If I go out there an hour later and I see the same people still sitting there, I will check and make sure they are doing ok.” Staff are able to make a quick visual check while passing a major corridor or carrying activities in the activity room.

Outdoor eating & feeding animals

Silver Life is flexible and open to outdoor eating. Residents are allowed and encouraged to have lunch and picnic in the courtyard. The process of requesting an outdoor lunch is very easy; residents can inform any staff around them and the staff will then have kitchen staff bring their meals to the table where residents choose to sit. Their tables will be cleaned and reorganized once they're done and leave. During the observation, many residents requested an outdoor lunch; they were very familiar with the process and enjoyed the service. During lunch time, some family members brought their lunch from home; they had lunch with residents at the courtyard. Besides, a BBQ grill is placed at the courtyard for a cookout; it can be used by staff for programmed activities or by family members for a family party.

In the past, residents were allowed to feed birds with small pieces of leftover breads. Feeding animals is prohibited now because some residents feed birds with hamburgers and eggs. The administrator stated, “It’s challenging to keep everything look good. Two residents bring hamburgers and eggs to feed birds. One resident got upset with us because she believed birds are eating those. She tried to save things and hopes we have fine use of everything, instead of putting in garbage bins so she wants to use the leftover like a piece of hamburger. She thinks she can use it by giving it to birds.” The residents eventually stopped throwing foods after staff communicated with them regarding the issue. The administrator said, “Only two out of one hundred residents here want to do that. It just needs to take one-on-one time to manage particular residents. Lots of residents have bird feeders, which they think are great.”

The behavior management indicates a process of negotiation between two value systems: “saving foods” and “looking good”. Some people may have norms of not wasting food; feeding animals

is one way to save foods before throwing them into garbage bins. Having leftover may reflect mismatch between designed menu and resident's preference Individualized meal planning may help reduce the conflict (Bonnel, 1995). Unfortunately, the organization did not continue to tackle the issue and have more discussions of underlying meanings of the behavior.

The behavior of feeding birds may also reflect residents' desire of interacting with animals. One resident expressed that she misses the pleasure of observing birds chasing toasts she threw in every morning. To satisfy the need, maintenance staff place many public bird feeders and help fill bird food. Furthermore, residents are allowed to hang personal bird feeders outside their bedroom windows; personal bird feeders are taken care of by their family members.

Change of the courtyard:

No rules specify the extent to which residents and family members can modify environments through gardening or making decoration. Based on the observation, residents were allowed to make some temporary changes such as deadheading and pick up tomatoes spontaneously. The director puts it, "Gardening is their choice and self-determination; they decide that they want to pick up some pieces and eat them or weed the garden rather than we said, "Ok, it is garden time."" With staff's assistance, they may dig soils or place flower baskets. Any attempt of making permanent changes such as adding garden space required approval from the administrator.

3. Support of the experiential attributes

Figure 6-1 illustrates the results of auditing evaluation for organizations. Overall, the administrator assign higher scores to the nine attributes (mean = 4.46) than the researcher (mean= 3.80). Score discrepancies between the two raters shows in five attributes: "Privacy", "Accessible space and built features", "Familiarity", "Sense of ownership" and "Participation in meaningful activity". From the researcher's perspective, inadequate organizational support (e.g., resources and policies) in

individualized activities and residents' decision-making may cause the courtyard less personalized, accessible and meaningful.

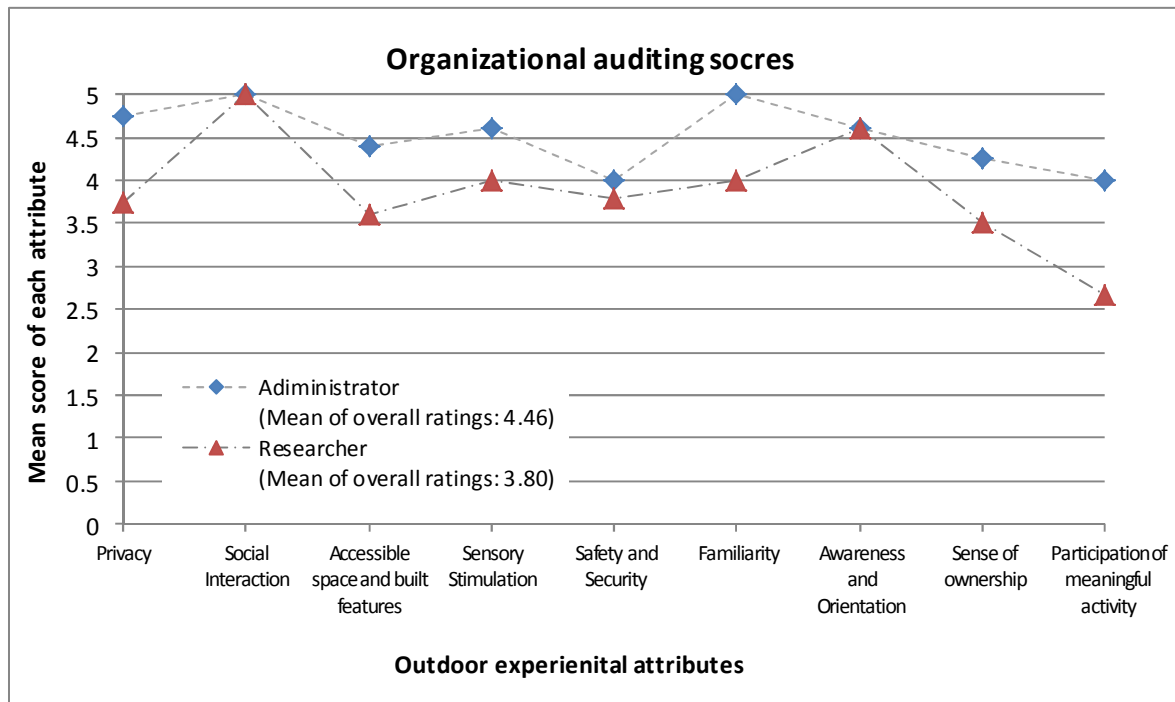


Figure 6-1. Auditing scores of organizational aspects of the courtyard at Silver Life

B. Staff-resident relations in outdoor programs

This section describes overall Silver Life's staff resources and staff-resident interactions in the courtyard. The former was evaluated using the Resident and Staff Information Form (RSIF) and the latter describe resident influences and staff responsibilities.

1. Staff in the facility: variety and training

In Silver Life, a variety of staff including four physicians, four occupational/physical therapists, one psychologist, two social workers, one religious counselor and six recreational therapists (one activity director, three regular staff and two activity assistants) are hired and paid by the facility. Approximately 80 percent of employees have worked in the facility for more than 12 months. Nine percent are male. No staff speaks languages other than English. There are in-service training programs including 1) training during orientation with continuing on-the-job training, 2) training at regular staff meetings on a continuing basis and 3) training at regularly scheduled meetings with programs of films and outside speakers.

Training program is also available for volunteers. There are a total of 12 volunteers in a typical week. Their time include 40-hour help in activities and treatments and 10-hour assistance in administration or maintenance. In other words, each resident receives 2.08 volunteering hours on average per month (96 residents in total). Based on the RSIF scoring formula, Silver Life has 92.3 percent of staff resources listed in the RSIF¹⁴.

2. Resident influence and staff responsibility

In general, Silver Life has a top-down decision-making process related to the courtyard. Staff take care of the courtyard. They are the major gardeners.

¹⁴ A total of 12 out of 13 resource items listed in RSIF are provided; $12 \text{ (total score)} \div 13 \text{ (a maximum of possible points)} = 92.3\%$

1) Gardeners of the courtyard

Planning & funding:

The courtyard was defined in the initial building plan by 22 years ago. None of the current administrator and activity director is involved in its design. In every spring, the administrator purchases flowers and picks up furniture with some input from activity staff and residents.

The funding of the courtyard are included in a building and maintenance plan. Maintaining perennials is given a financial priority. The administrator mentions, "Initially the cost (of maintain the courtyard) is probably much higher, and now we just maintain it. It is not a high amount. If we have to get some perennials this year, fewer annuals will be added." Family members donated plants. The activity staff also made some fundraising for special events.

Planting & maintaining:

All flowers will be purchased before the Mother's Day every year. Activity staff pick up a planting day and mark it on an activity calendar. Staff did most of planting works with some resident's help. According to the activity staff, only few people like to dig the soil; although most of them just observe, they like to make decision of what colors of flowers should go where.

No appropriate tool or wheelchair-accessible raised bed is provided to facilitate gardening. Few residents may do light gardening such as deadheading on planting boxes or containers. Watering is done collaboratively by maintenance staff and family volunteers. Activity staff help with that sometimes when they feel necessary. No tool allows residents to water in a safe manner. A water hose is not quite accessible, and a water can is too heavy. Although residents are unable to water the plants, according to activity staff, they supervise the activity. They ask staff to pay more attention on flowers if the weather is too hot.

Maintenance staff and contracted workers are responsible for heavy duties like cutting grass and trimming shrub and perennials.

Changing the courtyard

Residents are allowed to make temporary changes of the courtyard through gardening and decorating activities. Residents would pick up garden-grown tomatoes and taste them right away. In terms of decoration, some residents hang their own birdfeeders and flower baskets outside of their windows. In the past, staff members help residents tie memory notes around trees to create a landscape that means to the residents.

Activity staff and family members also make temporary changes. Cultural symbols like a wheelbarrow and pinwheels were placed by activity staff. Some chairs were donated by people in memory of their family members. They are inlaid with brass plates engraved with the names of beloved ones.

Permanent changes have been initiated by the administrator, activity director and volunteers. The administrator would ask maintenance staff to trim trees and take care of built environments. The director proposed some changes. Two years ago, she asked to extend concrete pavement and add a planting table. The two ideas were eventually executed. The planting table was a project of an Eagle Scout, who contacted the director to propose an accessible planting space. It was quickly approved to replace an old raised bed which has no knee space underneath for wheelchair users. In the paving project, the activity director first got consensus among her staff before reaching an agreement with the administrator. The proposal included quote of changes and discussed future benefits and marketing values of the changes. The review process took a few weeks because the change was funded by the corporation and involved with different departments.

There is a permanent change made by a family member, whose mother was a resident 12 years ago. She designed and donated a garden space at the center of the courtyard.

2) Ownership the courtyard

The courtyard is perceived as a place with multiple-ownership. The administrator prefers a multiple-ownership concept. She puts it, “it is really a group ownership because no individual person can do something that influences the whole courtyard without other people’s input.” The activity director feels that the courtyard is owned by both administrator and residents, and activity staffs are just facilitators to enhance resident’s ownership. She felt the need to “fight for” more ownership on behalf of residents. The front line activity staff thinks that residents did have a sense of ownership but it only happens when they help staffs make decision on where to grow flowers.

3. Support of the experiential attributes

Figure 6-2 shows auditing scores of staff-resident relations. Overall, the front-line activity staff assigned a slightly higher score on most of the dimensions than the researcher. Each of the dimensions falls between 3 (uncertain/neutral) and 4.5 (between “very good, could be improved” and “very successful”), resulting in a mean of 3.80. From the staff’s perspective, staff practice and attitude increase the scoring of five attributes: “Privacy”, “Awareness & orientation”, “Social interaction”, “Familiarity” and “Sense of ownership”. Factors like inadequate staff, less flexible work protocols and a lack of knowledge made the courtyard less meaningful, accessible and secured. The researcher’s evaluation shows a similar trend. The difference is that “Social interaction” score at the top in the researcher’s assessment. During the observation, staff practice facilitated different forms of social activities. Residents were encouraged to participate in self-initiative and structured activities. Furthermore, adequate resources and flexible outdoor policies (e.g., free furniture arrangement and outdoor eating) allow staff to arrange social settings in a way that meets different needs

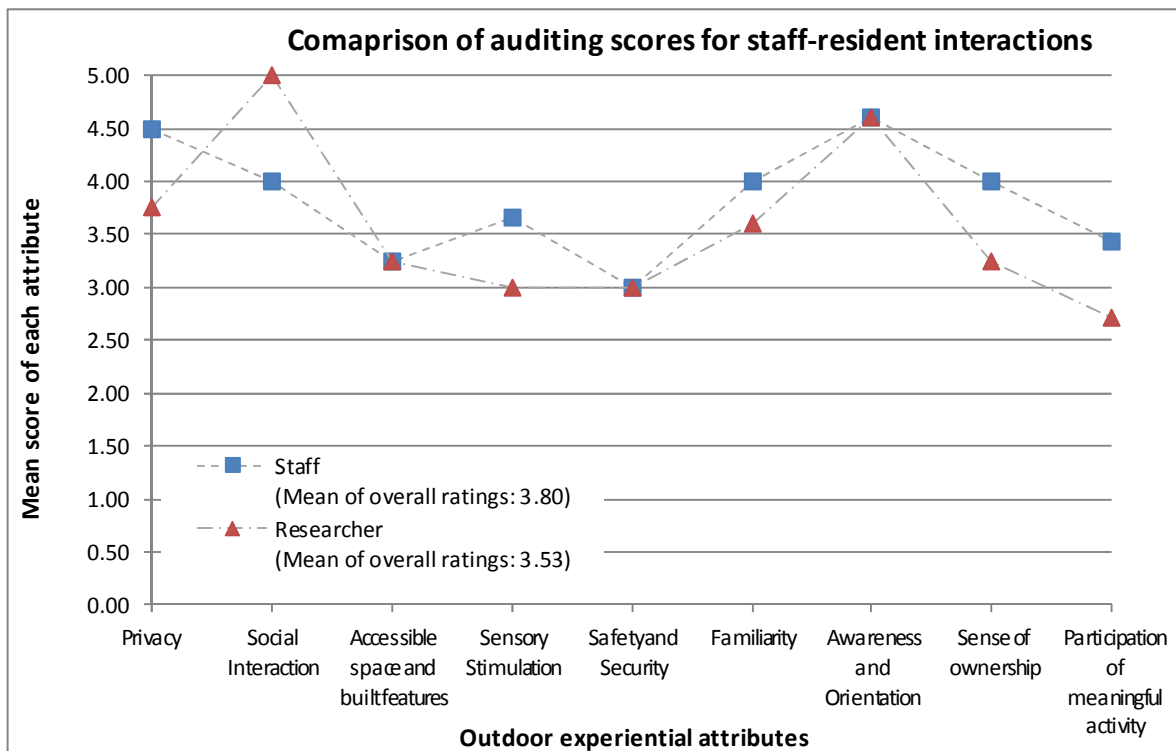


Figure 6-2. Auditing scores of staff-resident interactions

C. Resident profile

1. Demography and background

Silver Life had 96 residents in 2013. Most of them have a higher social and economic background than residents at the other two facilities; approximately 40 percent of residents have high-school education and another 40 percent have college or higher education. One-third of the residents are semiprofessional, managerial and executive.

Twenty percent of residents are male. Over 70 percent aged 85 or older. The average age of the residents is 89. Most of them were born before and after the Great Depression. The majority are Caucasians (99%). Most of them (46%) have a Catholic background. No resident speaks a language other

than English. Approximately 94 percent of the residents have been living in Silver Life for more than 12 months. One-fifth of the residents pay with Medicare and one-third with Medicaid. According to the activity director, approximately 90 to 95 percent of the residents had experience of gardening in the past. She put it, "They either had a victory garden or grew upon a farm; they may also work on someone's farm. Most of them had a garden in the past... It was very agricultural in that generation."

2. Functioning and activity participation

In terms of cognitive impairment, approximately half of the residents have either moderate or severe dementia. Ninety percent of them use wheelchairs. Approximately 20 percent have poor upper limb capacity; they may have difficulty of using a gardening tool or watering.

In Silver Life, most of the residents need assistance in daily activities like dressing, walking, getting in and out of bed and bathing (Table 6-2). Most of the residents are able to eat their meals independently and make their needs clearly understandable. Over 70 percent are completely dependent on staff to get to the bathroom on time and go shopping. Issues of incontinence prevail among the residents, which makes a washroom near the courtyard become very critical. To reduce fear of not getting into the bathroom on time, it is also important to have a caring protocol that allows CNAs to help residents in a bathroom near the courtyard, and then to offer choices of going back to the courtyard. Unfortunately, although there is a bathroom nearby, a flexible caring protocol is absent.

Table 6-2. Percentage of the residents in carrying activities of daily living in Silver Life

		Number who do this without help	Number who do this with some help	Number unable to do this
1.	Grooming	30%	60%	10%
2	Eating	80%	18%	2%
3	Dressing	13%	85%	2%
4	Walking	5%	85%	10%
5	Getting in and out of bed	10%	85%	5%
6	Bathing	0%	98%	2%
7	Toilet	5%	25%	70%
8	Communication	80%	15%	5%
9	Handling money	2%	15%	83%
10	Using a telephone	30%	60%	10%
11	Shopping	0%	10%	90%

Most of the residents participate in passive leisure activities such as watching TV, reading and playing games in a typical week during summer time (Table 6-3). Outdoor activities such as taking a walk and sitting at the courtyard are also very popular. Only five percent do some light gardening such as picking up tomatoes, deadheading, and getting rid of weeds.

Table 6-3. Percentage of the residents take part in the following activities

1	Watched TV	95%
2	Listened to music	95%
3	Read a newspaper or book	50%
4	Wrote	5%
5	Sewed or knitted	5%
6	Played cards, checkers, chess, or a similar game	80%
7	Played pool, bingo, or dominoes	40%
8	Drew or painted	20%
9	Engaged in ceramics or other hobby	20%
10	Took care of plants or gardened	5%
11	Went outside and sat at the courtyard	85-90%
12	Took a walk	50%

3. Residents' experience of home garden and gardening

Residents' experience of home gardens was obtained from in-depth interviews. Twenty-one residents (six males and 15 females) of Silver Life participated in the study. The average age of the group

is 87, ranging from 64 to 104. Approximately 90 percent of the group is wheelchaired, and 57 percent may not know what day and year it is. Their occupational backgrounds are diverse including unskilled laborer, blue-collar worker, clerical worker, homemaker/housewife, semiprofessional, and professional. Approximately 62 percent of the group participates in scheduled activities for more than three times a week.

All interviews are digitally recorded. They are transcribed to written form for coding and content analysis. Ten major themes were developed including 1) garden rules, 2) a shared & compromised garden, 3) food bank, 4) sensory experience, 5) a nature lab, 6) competing with nature, 7) work ethic, 8) hard work, 9) feedback, and 10) my home, each of which has sub-sets. A total of 26 sub-themes are created and listed in Table 6-4 with their example narratives and frequencies occurring in the interviews. A full list is provided in Appendix M.

Overall, two major themes: “sensory stimulation” and “garden rules” were frequently discussed, followed by “my home” and “shared & compromised gardens”. Topics related to “a nature lab” and “work ethic” were less popular. A brief of each of the major theme is presented in the following section.

Table 6-4. Major themes and their frequency emerging from resident interviews in Silver Life.

Major themes	Sub themes (# of frequencies)	Example narratives
Garden rules (70)	Following rhythms of seasons (13)	<ul style="list-style-type: none"> • We used to clean up our garden in the fall and pull dead stuff so it would be ready for the spring. When the spring comes, of course, you have to clean up again.
	Principles of better gardening (28)	<ul style="list-style-type: none"> • You have to hill potatoes. When you plant potatoes in the ground, you hill them. You cover them with the soil. Everybody knows about that.
	Family teamwork (29)	<ul style="list-style-type: none"> • I have eight sisters and we used to help in gardens. It was a family project. My dad led us to do gardening. That was my family time.
A shared & compromised garden (45)	Family first (21)	<ul style="list-style-type: none"> • All vegetables were for the family. There was not enough food to share with neighbors.
	Sharing food & information (19)	<ul style="list-style-type: none"> • I canned tomatoes and gave some to my neighbors.

	A compliant place (5)	<ul style="list-style-type: none"> • My kids didn't care about peas and my husband didn't care either. If I wanted some, I went to stores to buy some. I grew something my family likes. I won't force them to eat something if they didn't like it.
Food bank (38)	Food bank (38)	<ul style="list-style-type: none"> • I grew cucumbers, tomatoes, radishes, beets, different kinds of beans, red and green peppers. I had parsley all the time. I also had spinach and lettuces.
Sensory experience (115)	Beautifying the house (29)	<ul style="list-style-type: none"> • We put two rose bushes at the front of the house, one at each side of the front door. We had gladioluses too. I loved Black-eyed Susan. I grew asters at the border. We usually had white lilies and different kinds of tulips. They were so beautiful.
	Interactions with pets or wild animals (16)	<ul style="list-style-type: none"> • Once in a while, I saw deer in my garden. I chased them away because they ate whatever they saw.
	Cooking from gardens (70)	<ul style="list-style-type: none"> • I did grow enough tomatoes so I canned them for soup in winter time... It was so wonderful to go to the garden and pick up tomatoes and cucumbers for salads.
A nature lab (15)	Gardening as trial and error (12)	<ul style="list-style-type: none"> • I learned by mistakes. I tried several times and learned how to grow things.
	Unpredictable gardens (3)	<ul style="list-style-type: none"> • Sometime you thought you were planting something but it turned out to be another plant. Sometime, you didn't expect they can grow to such height
Competing with nature (39)	Battling with the uninvited (32)	<ul style="list-style-type: none"> • I pull weeds by my hands. If they were hard to kill, I would spray them. Pulling them out may make no difference because their roots are so long. Sometimes you have to put something on these weeds to kill them.
	Weather factors (7)	<ul style="list-style-type: none"> • There is not much you can do when the weather is too hot or too cold. You can cover plants if it is too cold. If it is too hot, there is not much you can do except watering.
Work ethic (16)	Never-ending tasks (12)	<ul style="list-style-type: none"> • You keep pull out weeds until you don't see them.
	Doing everything yourself (4)	<ul style="list-style-type: none"> • (daughter's comment) He planted his own trees; if his trees dies, he dug out by himself, a truck after a truck after a truck...He was kind of doing-it-by-yourself person...He could do electrical, plumbing and woodworking. He was a master of everything.
Hard work (38)	Physical demands (8)	<ul style="list-style-type: none"> • When I gardened, I had to kneel down and bend body. Gardening is a hard work but it is a good exercise
	Starting from scratch (24)	<ul style="list-style-type: none"> • My mother used to grow marigolds from seeds, a very special kind. We grew those in her greenhouse and transplant them to the garden. I also grew a lot of flowers from the seeds. Sometimes I went to

		nurseries and picked up whatever I like.
	Learning new things (6)	<ul style="list-style-type: none"> • I collected paper clips about organic gardens and a couple of magazines.
Feedback (32)	Self-value & satisfaction (19)	<ul style="list-style-type: none"> • When something I expected came true, I felt so great. • When we ate food we grew by ourselves, we felt proud and felt good about it
	Physical health (6)	<ul style="list-style-type: none"> • Gardening is a good exercise. You move things around.
	Relaxation (7)	<ul style="list-style-type: none"> • I felt quiet and peaceful when sitting on the patio and looking at the garden.
My home (54)	Family tradition (10)	<ul style="list-style-type: none"> • My father taught me how to grow tomatoes. When he got home from work, he went out a lot for tomatoes. Like father like son. I am like my father a lot.
	Gardens as a part of life (9)	<ul style="list-style-type: none"> • After my husband died, I couldn't take care of the garden, no more. I sold the house in Texas and moved back to Wisconsin.
	Dwelling and resting (24)	<ul style="list-style-type: none"> • My husband built an enclosed porch on our patio. Everything was screened so I wouldn't get any allergy...we put furniture and used to have outdoor BBQ.
	Home at present/self at present (11)	<ul style="list-style-type: none"> • I miss my garden, I miss that I can do things and I miss my baking. • I can't do gardening now. I am in a wheelchair.

1) Gardens rules

“Gardens rules” describes perceived course of action or procedure for solving problems or increasing productivity of home gardens. One of the procedures is “following rhythms of seasons”. Most of the residents expressed that there is something that needs to be done in certain time. For example, they cleaned up gardens, turned soils and put compost in spring after frost alarms went off. Beth (SL10¹⁵) said, “As soon as the frost was out of the garden in the spring, we started to get the garden ready to plant things. The time was probably in May.” Home gardens began to demand attention after Memorial

¹⁵ “SL10” means #10 interviewee of Silver Life (a complete list of the interviewees, see Appendix M)

Day. Ana (SL15) pointed out, “You don't plant things when the weather is still freezing. I would probably start in May around Memorial Day. That was the time that our garden started.”

Summer is the harvest season. Enjoyment from hard gardening work would probably end in October. In the fall, their gardens would be ready for the winter; annual plants were pulled out, and some perennials were covered by cloth. Carol (SL16) said, “In the fall before snow comes, you pull things out and work on the ground.” Efforts of preserving taste of summer gardens were paid back in winter time. Most of the people recalled that canned tomatoes used in soup or stew were unforgettable flavor (more detailed discussion can be found in the theme of “sensory experience”).

The seasonal change is part of the nature’s program and so is the growth of plants. These residents are also aware of “biological codes” of plants. The sub-theme of “principles of better gardening” discussed their knowledge of botanic rules and their code-compliant practices. For example, in terms of nutrition, Ella (SL4) said, “When you see flowers turning brown, you have to do deadheading” so no seedheads are created to consume growth energy”. Dolly (SL6), who had gardened since childhood, stated that “You have to rotate vegetables and stuff every year” so soil nutrients are not depleted. Jane (SL14) stated that coleuses should be in the shade, and raspberry bushes need a lot of sun. Following these principles may lead to high probability of a successful garden.

Besides nature’s program, there is a human’s rule. Most of the interviewees perceived home gardening as family teamwork with a clear division of responsibilities. Fathers usually took charge of tasks that require physical labor such as mowing, building fence, fixing things, planting and trimming bushes. Mothers took care of vegetables and flowers, watered, pulled weeds and processed garden-grown foods. Children helped weed. Aaron (SL8), a retired school teacher, recalled, “I mowed the lawn and my wife did gardening. She asked me to repair things and do mowing. She took care of flowers. She died 17 years ago and nobody took care of flowers now.” Ella (SL4), whose childhood was spent in gardens, stated that “I have eight sisters and we used to help in the gardens. It was a family project. My

dad led us to do gardening. That was my family time.” Tim’s (SL21) family owned an 88-acre farm in Minnesota. His brother commented that farming and gardening were a family cooperative work; “Our farm was 88 acres. That was a family project. We have 10 kids in the family... We had to pull weeds out. At that time, we hated everything related to the garden...Older kids were like our bosses. They made younger kids to pull weeds.” Their mothers took care of vegetables and canned everything grown from the garden, and their dads were never in the garden. “He worked on machine in the shop, built fence and took care of cattle.”

The division of work may reflect a traditional social relationship and identity. According to Bhatti & Church’s observation, a home garden is gendered. “The idea of the garden, or more precisely the social meanings of the garden, varies in the accordance of social relations...the garden is also a gendered place where tensions and conflicts (and reconciliations) between men and women are played out, often echoes existing social orders.” (p. 185) However, the concept cannot completely explain the residents’ home garden. Some tasks such as weeding and planning are not so gender-or role-oriented. Beth (SL10) pointed out, “My husband and I used to work together to keep weeds out.” Mary (SL3) and her husband both decided which vegetables they grew. They also went to a nursery and picked up plants together.

2) A shared & compromised garden

“A shared & compromised garden” suggests that a home garden is social and interactive in nature. Its sub-theme “family first” describes that the value of a home garden is in its ability of sustaining a family. According to the residents, garden-grown foods were shared primarily among family members and vegetables are selected for planting based on families’ preference as a result. Clark (SL2), whose parents were experienced gardeners, recalled, “My parents grew vegetables that we liked. If they grew cabbages, nobody would eat them. I like yellow beans, and my dad used to grow those in their garden.” Ana (SL15) didn’t grow parsnips because she knew her kids were not in favor of those. If vegetables were over-grown, they would can or freeze them; preserved food helped their families go

through winter time. Adam (SL13) mentioned,” You put all edible things together. You can save a lot of money for the family.”

However, a family-first garden may indicate reconciliations. For example, Emma (SL7) loved gardening but her gardening time was always in the evening after she prepared supper and finished family chores. Beth (SL10) liked to cook everything with garlic; however, she said, “My kids didn’t like garlic. I put a little bit garlic in cook. It was not enough to get their attention.” Ana’s (SL15) garden was compromised in the same manner. “My kids didn’t care about peas and my husband didn’t care either so I didn’t grow peas. If I wanted some, I went to stores to buy some. I grew something my family likes. I won’t force them to eat something if they didn’t like it.”

A compromised garden may imply a social order described by Dovey (1985) or Werner (Werner et al., 1987) in their research on home environments; the order suggests a structure of a home that is conservative and inertial. On one hand, the order can be seen as taken-for-granted social hierarchy and gender relations (e.g., a mother’s sacrifice for her family); on the other hand, it reflects interactions between people with different social roles or identities, one of which is a care-giver and-receiver relation. A home and home garden is a “care of field”; a compliant garden may be experience that shapes or is shaped by an identity of being a caregiver, who gives protection to families.

Garden-grown foods are also shared with neighbors, relatives and communities. “Sharing food & information” describes exchange of garden-grown food and gardening information. Adam’s (SL13) daughter recalled that people in her father’s generation had a more clear sense of community. “If it was a good year and we had so many vegetables or food, my parents would share them with neighbors and relatives. Some of our neighbors would grow this and that so they exchanged food; you gave me a couple of these, and I gave you a couple of those.” Beth (SL10) had similar experience and said, “I didn’t grow zucchinis. My neighbor did and gave some to me. When they got too much, I got some too. They tasted good.” Home-garden grown food became a media building relationships with people outside of

their families. The connection was even expanded to include community members. Ella (SL4) would give bananas to a school, and Jane would bring tomatoes to her church for people who needed food.

The inter-dependent relationship was also reflected in exchange of information. School teachers taught Ella how to garden in return. Wendy (SL5) learned from her neighbor about gardening; she said, “I had a neighbor, who followed the same thing (growing flowers) I did...My neighbors asked me questions, and I also asked them what they put in their garden. We exchanged information. I had good friendships with my neighbors.” Jane (SL14) received help from her neighbor to improve her garden. “I had a neighbor, who took courses of horticulture and worked for a florist. She helped me out. She knew a lot of things about coleuses.”

3) Food bank

A function of a home garden was to provide food. People grew a variety of vegetables, fruit trees and herbs in their gardens. A home garden acts like a nearby food bank giving an autonomous way of living; Clark (SL2) recalled that they could just pick up ingredients from their garden anytime they want. “My mom grew carrots and peas. We grew carrots in barrels, and we just dug them out when we needed...If you have a garden and you are good at it, that garden will be able to sustain yourself. That can save you money. Instead of buying things from stores, you just go to your basement or get things out of your garden. It cuts down your expense if you have a good garden.” With a home garden, people were able to handle food based on their needs and preference. Ella (SL4) stated, “It was so wonderful to go to the garden and pick up tomatoes and cucumbers for salads right away.” Many of them argued that their home-grown tomatoes were much fresher and had more flavors than their counterparts from the stores... Emma (SL7) commented, “Tomatoes in stores have sat there for a while. They are not as fresh as those you grow by yourself.” Beth (SL10) grew carrots, tomatoes, lettuces, onions and corn. She said, “Radish! Oh! You can’t pass that. You just wash them and eat fresh one... We grew lettuces. Those were not the same with what you buy in the store.

4) Sensory experience

The theme collects discussion of visual, taste and smell experience provided by a home garden. The experience sometime connotes a deeper meaning of self-identity or attachment to a particular person.

“Beautifying the house” describes people’s attempt of enriching visual stimulation of their gardens. Jane (SL14) created a colorful garden with tulips, daily lilies, daffodils, verbenas, marigolds and lilac bushes. She mentioned, “Having a garden beatifies your house. My garden attracted people coming from the street.” She was proud of herself of being a green thumb; “One man asked me how I made these flowers growing. I said, “I don’t know. I just planted them.” She cut the flowers and made bouquets to decorate interiors of her house; the visual experience was extended from outside to inside of her house and so did Jane’s self-identity and self-achievement. Martin (SL1) grew roses; he said, “Roses are my favorite flowers. I like anything red. I am a red guy.” Red roses became a part of Martin’s self-representation; “I used to cut the roses and gave them to my wife. I would also put flowers at the dining room table.” Martin’s favorite food is home-grown red tomatoes. He used to grow tomatoes in his garden and share them with his favorite person in the family.

Beth (SL10) said she had 350 gladiolus bulbs; they created a variety of colors in spring. Taking care of them (digging them out in the fall and planting again in the spring) was her signature event in her garden. Dolly (SL6) grew many flowers including roses, daylilies, marigolds and tulips. She has two separate albums to record these flowers every year. It reminds her of what has been achieved by doing so.

“Interactions with animals” in gardens also brought some interesting experience. Amber (SL11) remembered the moment she saw beautiful deer in her garden; skunks were not as welcome as bunnies. “I like these little bunnies. They were surprise of my garden.” Ella (SL4) enjoyed watching hummingbirds

and robins, and Wendy (SL5) had fun watching squirrel and chipmunks playing in her garden. Something horrifying might be another surprise; Adam (SL13) and his daughter were terrified by a spider corner.

Taste and smell of home gardens were frequently brought up during the interviews. A major proportion of the interview content was reminiscence of unforgettable flavor of home-made food. Fresh tomatoes were common memory of these home gardeners. Most of the residents like Mary (SL3) and Ella (SL4) felt that their home-grown tomatoes were so fresh and sweet and are much better than in-store produces. Martin (SL1) loved tomatoes and grew 10 tomato bushes. He recalled, "My wife put tomatoes in salads. She put some cheese, olive oil and basil. One of my daughters loves that too. The biggest surprise of my garden was big tomatoes. Their taste was fresher than those you bought from the store."

Memories of "cooking from gardens" often reflect reminiscence or bonding of a person, who cared for family. Clark (SL2) thought of his mother; "My mom would use our tomatoes in salads and stew. That was very good. She was a great cook. She did a lot of canning like pickles." Aaron (SL8) also connected the taste of gardens with his parents or his childhood home. "It was very nice to have fresh food from my dad's farm... My mother was so into preserving food. Oh, gosh! She was good at it. She was a good cook, wife and mother." Tina's (SL18) mother was also a good cook; she recalled, "My mom used to bake green peppers. She put meat inside and baked them. That was delicious... My mom used to cook leave of beats; same way you cook spinach. Medium-size beets are tastier".

Most of the female interviewees were persons taking care of family's dinner table. They still remembered recipes of cooking from gardens. Amber (SL11) stated, "Squash is for baking. You peel them and cut them off. You put them in a pan with brown sugar and little bit butter. You bake it." Dolly (SL6) used to sauté zucchinis with onion or make zucchini bread; she was also good at making peach pies. "I think I am a good cook"; she was very confident in filling family's stomach with fresh ingredients from her garden.

Most of the residents knew how to preserve food. To prevent food from rotting, people canned, pickled, froze and sugared food. Adam's (SL13) daughter stated "My mother either cooked things up or canned them or turn them into jam and jellies. She did whatever she could to help family go through winter." Adam himself would make some rhubarb wine. Mary (SL3) mentioned, "I had tomatoes, and I canned them. I got jars for tomatoes and put them in the basement so we had chili in winter." Dolly (SL6) picked whatever grew in her garden. Food preservation demands care and attention in several processes: dehydration, acidification, sugaring and sealing.

Wonderful home-made tastes may indicate that one's home is taken care of with love of food and pride of gardens. The residents' reminiscence of food is narrative of their home.

5) A nature lab

The discussions related to "a nature's lab" show that home gardening was perceived as conducting experiments. Interactions of environmental factors in terms of soils, water, temperature and microbes create unpredictable results every year. People learned and improved productivity by trial and error. Wendy (SL5) stated that "I learned by mistakes. I tried several times to learn about gardening...When flowers didn't grow well, I felt disappointed. I tried to think where I did wrong. "Beth (SL10) had the same manner. "We learned from trying different things. You learn from what you are doing. Nobody taught us how to garden." Failing this year also means a second chance of trying next year. Emma (SL7) commented, "When things didn't go so well, I could try next year." Jane (SL14) felt that keep trying is the only thing you can do when growing wrong plants. To these gardeners, home gardens challenged them to find solutions. As gardening skills improve with experience of dealing with different problems, so do crop yields and flower performance.

Sometimes results of gardening were beyond resident's expectation. Clark (SL2) recalled, "Sometimes crops came out more than you can handle. When we had a lot of tomatoes, my mom canned, stewed, and preserved them. "Jane (SL14) thought the unexpected result was the fun part of

having a garden; “Sometime you thought you were planting something but it turns out to be another plant. Sometime, you don’t expect they can grow to such height.” Ana (SL15) may count the surprise as a miracle in her farm; “I brought four little pigs about this big. When they got bigger enough, I had them breed. One night, they gave birth and I had 57 baby pigs. It was in January and the weather was cold so I piled the straws and put light for them.” Carol (SL16) has an explanation of something unanticipated in her garden; she said, “...They just can't grow by themselves. You have to thank God.”

6) Competing with nature

There were two major challenges perceived in home gardening: battling with the uninvited guests and overcoming challenging weather conditions.

The first challenge is about fighting for territory; these gardeners had a lot of experiences to deal with invasion of weeds or wild animals. Weeds like dandelions may take away nutrients from soils and frustrate people. Carols (SL16) used to dig them out; she said, “To clean them up, you have to get out all the roots!” Dandelions have persistent roots and regrow very quickly. Dolly would use sprays to kill weeds; “I pull weeds by my hands. If they were hard to kill, I would spray them. Pulling weeds sometimes made no difference because their roots were so long. Sometimes I had to put weed killers.” Amber’s (SL11) husband applied a more natural way to his garden; “We had some problems of weeds. My husband covered grass by sand and put plastics on the sand. He then placed rocks on the plastics. Grass died after few days. There was no need to pull out weeds.”

A fence was usually built to stop rabbits and deer from entering the gardens. Emma (SL7) said, “I put fence around plants. That might stop some animals eating my vegetables.” Adam (SL13) did the same thing but he found bunnies would jump over fences and still get what they want so he just gave up to a point. Some of the residents were not bothered by that; they were willing to offer free food for these wild visitors.

The other challenge was severe weather condition. People showed a sense of surrender to the nature's program. Dolly (SL6) expressed, "There is not much you can do when the weather is too hot or too cold. You can cover plants if it is too cold. If it is too hot, there is not much you can do except watering." Her experience echoed Emma's (SL7) comment; she said, "You don't have much control over the weather but you can always try next year." In a hot summer day, they felt watering was the only way to reduce losses. Cindy (SL12) recalled, "My husband would take several buckets of water to water plants if the weather was too dry or too hot. "

They made attempts to keep plants alive while learning and accepting that something cannot be altered or harnessed. Jane (SL14) would try to sprinkle; she commented, "The sprinkle was not as good as the rain coming down but it was better than nothing." Gale (GA6) made a justification as to the uncontrolled garden; "If things grow so well, you want to thank Mother Nature because you are not doing it by yourself...It is not just your effort. You cannot control everything." From her view, no one can claim full ownership of gardens.

7) Hard work

Home-gardening was perceived as a hard work because it usually starts from scratch and demands physical efforts. Martin (SL1) stated, "You have to break the ground and start all over again in the spring." Wendy (SL5) and her husband created a six-foot deep garden at the back and front of their house, and added flower beds around the garage. Emma (SL7) created container gardens by herself; it required her to do a lot of digging, flipping and moving things.

Efforts of caring gardens did not stop in winter. Some people grew plants with seeds; they collected seeds from plants and let them germinate in their basement during winter time so they were able to transplant seedlings in spring. Some vegetables like cucumbers, pole beans, peas or tomatoes need special attention; they would build fence, wood frames, sticks or wires to support their growth.

Gardening activities they carried may be considered as a high-to-moderate physical activity. Dolly (SL6) said, "When I gardened, I had to kneel down and bend body... I ruined my shoulder because I fell into tomato bushes." Gardening was not an easy task to Adam (SL13) either; he used to get down kneels to pull weeds with a lot of bending, standing and kneeling motion. Accessories like gloves may help protect hands; however, some people would prefer making things with bared hands. Beth (SL10) said, "I didn't use gloves. I didn't care whether the roses have thrones." People like Tim (SL21), who lived in a farm, were involved with more heavy works. He and his brother had to do barn cleaning, cattle feeding, milking, cow herding and weed pulling. In winter, snow made tasks even more difficult; "We had to shovel everything from the house to the farm during winter time...We didn't have snowplow. The snow bank created by the snow we dumped was above 200 feet for just trying to get a pass."

8) Work ethic

"Work ethic" describes residents' ideological work attitude toward a home garden. A home garden was perceived as a work field with never-ending tasks. Ella (SL4) argued that a good garden requires a lot of investment of time; "I used to wake up at 6 am and work in my garden for several hours...When I lived in my house, I had to wake up early to take care of plants...You need to spend a lot of time to take care of vegetables." Most of the residents would eliminate weeds before they took over gardens. Continuous attention and care were basic requirements for a clean garden. Emma (SL7) said, "Weeds come out every day. You have to do with it every day." Beth (SL10) would pull out weeds until the ground was clear. Adam's (SL13) daughter had observed how serious her parents were in taking care of gardens; she recalled, "My parents would spend hours and hours a day in the garden. They kept pulling weeds, keeping the ground tilted and loosening the soil." Adam himself viewed his garden as a work place; "I worked in the garden. I didn't enjoy gardening. I just worked years after years." Same attitude was found in Molly (SL20); she felt her home garden "had a lot of work to do...There was a lot to cut and to be taken care of."

Another aspect of work ethic is an attitude of “doing-everything-yourself”. Adam (SL13) was excellent in everything. His daughter mentioned, “He planted his own trees; if trees died, he dug them out by himself...a truck after a truck after a truck...He was kind of doing-it-by-yourself person...He can do electrical, plumbing and woodworking. He was a master of everything.” Ana (SL15) had a similar attitude; she made everything from scratch by herself. For example, she had pigs breed and then took care of their 57 baby pigs. She also had her own garden and made a jacket for her husband, sweaters for her sons and wedding gowns for her daughters; she stated, “I did a lot of gardening. I did a lot of things. I was interested in art for a while. I made my two lamps and put them together. The shade didn't come in time. If I got shade, the lamps would be complete and I would get the first price. I got a second price. I liked to paint. My husband never painted the room but I painted the whole house. I would do anything I could do in my hands. I also did a lot of sewing. I made my children's clothes. I knitted. I made their sweaters. I made my two daughter's wedding gowns with long train and beads. I made my husband's jacket.” She still believed that she’s able to do a lot of works if the facility lets her go back to her farm.

9) Feedback

“Feedback” describes intangible return of efforts in home gardens; it includes “self-value and satisfaction”, “physical health”, and “feelings of relaxation”.

According to the residents, their home garden or gardening helped them build self-worth and fulfillment; Dolly (SL6) said, “I liked to grow things and to see something different...When something I looked forward to came true, I felt so great...I felt satisfied and proud of myself when enjoying the vegetables I grew by myself.” The intangible return was related to tangible feedback— food—which helped sustain a family; Aaron (SL8) remembered that his dad “took a lot of pride of what he had been doing in his farm”. The pride came from being a good caregiver. Jane (SL14) also expressed that “I just felt self-achieved. The food was so good. If I wanted to eat, I could just go to the garden and grab some.”

Beth (SL10) showed gratitude for the food she grew. “I liked working with dirt. That was how I appreciate everything. The more you put in the more you respect out of it...When you grow something by yourself, you will appreciate the food.” She has five children, and because of her efforts, she could nourish the whole family with her garden. She appreciated the food; her productive garden dignified what she had done for the family.

Some people enjoyed their alone time in home gardens very much. They felt relaxed, calm and peaceful. Martin’s (SL1) garden was a “being-away” place, which allowed him to change attention from work to nature; he recalled, “I liked to spend some time in the garden after work...I liked to sit on my patio and read and write. My garden was pretty. I felt relaxed when being in the garden.” A home garden was perceived as serene and quiet; Amber (SL11) said, “I felt quiet and peaceful when sitting on the patio and looking at the garden.” To Emma (SL7), her garden was spiritual; “When I stay in my garden, I prayed and I felt relaxed. The garden was very peaceful.”

Besides psychological benefits, their home gardening brought physical health. Many interviewees thought gardening was a good exercise because it was involved with physical movement and different motion. People also loved fresh air and healing food. Ella (SL4) planted ginger in her garden; she loved ginger flowers and also used ginger in foods and hair care; “ginger is good for your stomach and hair. I used to wash my hairs with ginger. It made my hair shining.”

10) My home

“My home” described roles of gardens in their past and current homes. To most of the gardeners, home-gardening was a family tradition; their parents had a garden, and their children learned about gardening from them. Martin (SL1) recalled, “My father taught me how to grow tomatoes. When he got home from work, he worked in the garden for tomatoes. Like father like son. I am like my father a lot.” A home garden initiated connection between different generations and materialized family relationships. Martin has no son; he sees his grandson as his son. He used to share his favorite food:

home-grown tomatoes with him to express his love. Wendy's (SL5) garden affiliated with her husband's grandparents; "My husband's grandparents knew how much I like their yard. When we brought our first house, they were willing to help and teach me about gardening." In Wendy's case, emotional connection was enhanced through exchanging knowledge of gardening.

A home garden was a place for resting, and gardening was action of dwelling. Some people started gardening after they got a house; a sense of permanent ownership of a house motivated Wendy (SL5) or Isabelle (SL9) to create a home garden. Cindy's (SL12) husband created a porch for her to enjoy outdoor life. "My husband built an enclosed porch on our patio. Everything was screened so I wouldn't get any allergy...we put furniture and a grill for outdoor BBQ." In summer, a furnished patio was where family members and friends gathered. Jimmy (SL17) said, "We had a patio. We got breeze in summer. We used to have dinner or lunch outside once in a while." All in all, a home garden was a place to stop and let people to engage in different processes of place-making for a long stay.

A home garden was a part of life; it reflected living conditions in a particular period. Tim's parents had a large farm; they made a living by selling vegetables and fresh milk. Tim's (SL21) brother commented, "We cook everything from our farm. We had a wood stove in the living room and also in the kitchen for cooking. It warmed the kitchen. The heat went into bedrooms...Our bathroom was 75 feet away from our house. It was just a little house and a hole on the ground for your duty." Many of the interviewees were born before and after the Great Depression; given limited food resource, some people had experience of eating and cooking dandelions; Carol (SL16) recalled, "We cooked dandelions. My grandmother cooked them. She just fried Dandelion leaves with bacon grease." Cindy (SL12) tried dandelion wine made out of dandelion flowers.

A home garden may serve as an anchor of life; Jane (SL14) recalled, "Petunias were put on my sister's grave. She died when she was a baby. We always put petunias on her grave." A desolate home garden may indicate loss of beloved one or changes in life; Amber (SL11) mentioned, "After my husband

died, I couldn't take care of the garden, no more. I sold the house in Texas and moved back to Wisconsin." Loss of home and home garden may imply loss of competent self and announce relocation to an institutional home. Ana (SL15) has lived in Silver Life for several years. She misses her farm. "I miss the whole farm and little pigs. My little pigs were so cute." Similarly, Tim (SL21) expressed his desire of going back home; "We used to go to our barn to milk horse. We had to make milk. We feed sour milk to horses. I still miss the time and wish I could go back to the farm."

Acceptance of reality was epilogue of their reminiscence of home gardens. As Molly (SL20) stated, "My favorite thing is to cook. I used to cook things grown from my garden. I love cooking but I don't have any chance now. I live here." Her identity as a good cook or good caregiver doesn't seem to be verified by current living environments. Jane (SL14) used to be a passionate gardener; after a surgery, she was restricted to a wheelchair. When she was young, she was able to get out of her wheelchair and sit on the grass for gardening. Now, she has no upper-limb strength and loses interests of gardening. "I used to live in an assisted living facility. They had some raised planters where we could plant things but I never did. I don't know. I just never did."

Amber (SL11) moaned about loss of past life; "I miss my garden. I miss that I can do things and I miss my baking. One time, I wanted to price my brownies but I was unable. When I came here, my relatives threw all of my recipes away." Despite that, Amber still remembers recipes of potato soup and peanut butter cookies. She mentioned, "I had a recipe of peanut butter cookies I learned from a magazine. I shared it with the staff here. It only takes three ingredients: one cup of sugar, one cup of peanut butter, and one egg. You mix them all together and place them on an ungreased cookie sheet. You bake them with 350 degree for eight to ten minutes. That's it." Activity staff of Silver Life helped re-establish her self-value. She felt proud of herself from helping the staff.

These gardeners gave up their gardens in the transition from home to a nursing home; their identity of being a caregiver, cook and green thumb was also lost in the process. If one's self-value and

capacity for growth keep being ignored, living in a nursing home will be perceived as a path to the grave (Thomas, 1996). An institutional garden may ease the transit by enhancing self-identity or re-establishing a new one; providing activities of gardening, food tasting and sharing may convey a message that “we are making and taking care of our home”.

II. Golden Age Nursing Home

A. Organizational context

This section provides overall Golden Age’s organizational contexts and organizational aspects of the courtyard. The former described results of evaluation using the Policy and Program Information Form (POLIF) and the latter introduces three organizational dimensions of the courtyard: mission & philosophy, outdoor activity programs and outdoor policy.

1. Facility’s policy, care program and resources

Golden Age is a for-profit organization owned by a limited liability company (LLC) partnership. It is a licensed and certified Wisconsin nursing home, providing Medicaid-and Medicare-service. Initial entrance fee is not required, but authorizations with managed care insurance have to be provided. Services provided in the facility include room, board, cleaning, personal care, nursing care service, therapy & rehabilitation and recreational activities. There is no minimum age requirement for admission.

Similar to Silver Life, Golden Age’s organizational structure is simple and flattened. The administrator manages service departments including nursing, social services, dietary, activity, housing keeping and maintenance, and oversee contracted departments like physical therapy and occupational therapy. Departments like nursing and dietary have a director and several front line workers, but others like social services, housing keeping and social services have only two major staff.

The organizational role layer is simple, allowing the administrator to interact with front line staff. An informal staff meeting is a major means of communication between departments. The facility runs in day shift with a nurse-resident ratio of 1:20 and aide –resident ratio of 1:81 (Wisconsin Department of

Health Services, 2013). Approximately 50 percent of full-time nurses and seven percent of full-time aides have been employed for at least one year in 2013.

Golden Age's policy and care program is analyzed in terms of POLIF's eight organizational dimensions. Based on the scoring system developed by Moos & Lemke (1994), it performs better in "availability of daily living assistance", "policy choice" and "health services" but overlooks "resident control" and "room privacy" (Table 6-5).

Table 6-5. Golden Age's scores of POLIF

	Expectations for functioning	Acceptance of problem behavior	Policy choice	Resident control	Policy clarity	Room privacy	Availability of health services	Availability of daily living assistance
Score	0%	62.5%	77.78%	38%	62.5%	30%	75%	100%

1) Expectations for Functioning

The Golden Age has zero percent¹⁶ of expectation for functioning based on the POLIF's scoring system. It takes residents with limited to no ability to feed, bathe and dress. It accepts people with confusion or depression. They encourage individuals to make their own bed and clean their rooms. Residents are not expected to be ambulatory.

2) Acceptance of Problem Behavior

Many types of problem behavior are allowed in the Golden Age. The facility accepts 62.5 percent¹⁷ of types of problem behavior listed in the POLIF. Residents can refuse to participate in activities or to take prescribed medicine. Wandering around the building at night is acceptable. It is tolerable if individuals refuse to take a bath regularly. Behavior like being boisterous, stealing, damaging property, attacking staff is discouraged; an attempt will be made to stop it. Intolerable behavior includes taking too much medicine, taking medicine other than prescribed one, leaving the facility without

¹⁶ A total of zero out of 11 expected functioning items are found; $0 \text{ (Total score)} \div 11 \text{ (a maximum of possible points)} \times 100 = 0\%$

¹⁷ A total of 10 out of 16 types of problem behavior are acceptable; $10 \text{ (Total score)} \div 16 \text{ (a maximum of possible points)} \times 100 = 62.5\%$

informing staff, attacking residents, verbally threatening other residents, and indecently self-exposing; a person who continuously carry such behavior might be asked to move out.

3) Policy Choice

Golden Age allows a great degree of autonomy. It provides 77.78 percent of policy choices¹⁸ listed in the POLIF. For example, residents are given an hour range during which residents can choose to eat breakfast, lunch and dinner. Visiting hour is from 7 a.m. to 8 p.m. per day. Residents are allowed to drink liquor with a doctor's permission; they can have their own furniture in rooms, do light laundry, and skip breakfast to sleep late. Residents are not required to wake up and go to bed at a certain time. However, they are expected to take shower regularly in certain times. Some areas (like stairways) are locked to limit access.

4) Resident Control

Residents are seldom involved in decision making at Golden Age. It provides 38 percent¹⁹ of means listed in the POLIF in terms of resident control. Although there is a resident council scheduled once a month, there's only one resident representative. There is no house meeting for residents and no resident committees. According to the administrator, residents can decide programmed activities with staff's input. However, the activity director held an opposite point of view.

Residents are consulted for menus, mealtimes, visiting hour, decoration and moving a resident from one bed or room to another but staff make the final decision. Residents are not given rights to handle complaints from other residents, select new residents, change staff and make rules about alcohol use.

¹⁸ A total of 14 out of 18 rules are provided; $14(\text{Total score}) \div 18$ (a maximum of possible points after subtracting one n.a. from 19) $\times 100 = 77.78\%$

¹⁹ A total of 11 out of 29 means are provided; $11(\text{Total score}) \div 29$ (a maximum of possible points) $\times 100 = 38\%$

5) Policy Clarity

Golden Age provides 63 percent²⁰ of means for policy communication listed in the POLIF. The facility has a handbook and an orientation program for residents and staff. Except that, verbal communication is a major means of delivering information. There is no newsletter or bulletin board for policy announcement. No formal staff meeting is regularly scheduled; informal and small staff assembly is preferred.

6) Provision for Privacy

Golden Age provides 30²¹ percent of privacy-related items listed in the POLIF. In the facility, more than half of the residents live in a semi-private room; two residents at most share one room. Given limited space, there is no private bathroom, and some bathrooms are shared by four residents. There is no individual mailbox. Each resident has a dresser in his or her room. Residents are allowed to close their door but disallowed to lock it. A private and closed office can be used for interviewing residents.

7) Availability of Health Services

Golden Age provides 75 percent²² of availability of health service listed in the POLIF. It offers health services including regularly scheduled doctor's visits, assistance in using prescribed medications, physical therapy and occupational therapy.

8) Availability of Daily Living Assistance

Golden Age provides 100 percent²³ of daily living assistance list in the POLIF including legal advice, barber service, assistance with banking, housekeeping, grooming, laundry, shopping and transportation. Each meal is provided every day. Snacks are served in the afternoon on a typical day.

²⁰ A total of five out of eight means are provided; $5 \text{ (Total score)} \div 8 \text{ (a maximum of possible points)} \times 100 = 62.5\%$

²¹ A total of three out of 10 privacy items are satisfied; $3 \text{ (Total score)} \div 10 \text{ (a maximum of possible points)} \times 100 = 30\%$

²² A total of six out of eight health services are provided; $6 \text{ (Total score)} \div 8 \text{ (a maximum of possible points)} \times 100 = 75\%$

²³ A total of 14 out of 14 types of assistance are provided; $14 \text{ (Total score)} \div 14 \text{ (a maximum of possible points)} \times 100 = 100\%$

2. Organizational aspects of the courtyard

1) Mission and philosophy

Ownership of Golden Age was transferred to a new company in 2012. According to the administrator, “the new organization wants to make the courtyard more appealing to the eyes...A beautiful courtyard was what the previous owner liked to create but failed because of inadequate finances”; little revenue came from Medicare, and the facility is not fully reimbursed for the Medicaid costs. The majority of facility’s expenses were to fulfill basic requirements such as nursing service, dietary and maintenance. Very little was spent on courtyard to upgrade residents’ outdoor experiences.

From the activity director’s perspective, value of the courtyard goes beyond visual appreciation. She put it, “the courtyard is mainly therapeutic. It provides a way for residents to be able to look at and enjoy something of beauty, and a way to remember things they have done in the past when they were younger.” With limited budgets, she managed the courtyard with staff-donated flowers and vegetables, trying to make courtyard not only appealing but also participative. However, many maintenance and accessibility issues have limited the development.

A visually appealingly courtyard may reflect a marketing-oriented mindset. The courtyard is nothing more than a decoration of building exterior. Given such mindset, it is very likely that outdoor experience is prioritized; passive outdoor activities such as nature observation are preferred; active interactions such as gardening (watering, getting rid of weeds and digging soil) may not keep environments sterile and beautiful.

2) Outdoor activity program

Outdoor activity programs are decided by the activity director and staff, and the administrator has strong input. In 2013, the administrator started to ask the director to bring more residents outside to the courtyard. As the administrator put it, “To be honest with you, I didn’t pay too much attention to it before. The courtyard is just there. I use it more now just because it is very helpful out there. We have

more current residents who like wandering, walking and ambulatory, and the courtyard is safe for them, which makes me use the area more.” The change was not a group decision; the activity director and staff were just executors of the order.

Scale and operation

A typical outdoor group usually takes 10 residents and lasts for 30 to 45 minutes in the courtyard. It is led by one activity staff, and requires all activity staff (a director and one front line staff) to transport residents. Fifteen minutes before and after an activity are reserved for transportation. Golden Age’s activity calendar in July, 2013 showed that outdoor activities were scheduled every two days per week. If the weather is permitting, a morning exercise and an afternoon game will be hosted in the courtyard. The director put it, “What we do is basically going to the flow. We have to be very flexible because of the weather. We will have outdoor activities if the weather is decent. Sometime if we have something specifically planned in the courtyard, consistent with the calendar, the weather may not cooperate with us necessarily.”

Having an outdoor activity is laborious due to a lack of support. The activity staff mentioned, “If I am not here, the director will take all 13 people by herself. See, that is why I gave you that look (Laughing). This is the work that you do by yourself. You will learn how to adapt and make that work... If 15 or 20 people like to go to the courtyard and the director is busy, I will wheel them one by one by myself. I use the automatic door but sometime I have to lift wheelchairs to pass the threshold. It takes time. The way we did on 4th of July has some extra help but in other time you do by yourself.” As discussed in Chapter 5, the courtyard is not wheelchair accessible. Staff have to lift wheelchairs over a threshold. Not only residents but staff may be hurt during transportation; safety concern may reduce willingness to bring residents outside. Limited cooperation across departments makes tasks even more difficult.

The activity staff expressed that she learned how to conduct activities by herself with very scant educational and training resources.

Types of activities

There are two types of outdoor activities in the courtyard. The first group includes different social activities such a reminiscence hour, book club and a cookout event. The second group includes different forms of physical activity such as stretches, ring toss, horse shoes, and basketball toss. Activities in either group are compatible with an indoor and outdoor setting. Since there is no minimum amount of outdoor activities required by the administrator, it is staff's call on where to have an activity.

Structured gardening is not provided because planting areas are only available in the ground level, and no assistive tool is provided for watering and weeding; gardening in the courtyard will be a risky activity to wheelchair residents.

Evaluation of activity programs

Evaluation of activity programs is informal and spontaneous. The activity director described, "We encourage residents to use the courtyard as much as possible. However, quality of the activity depends a lot on weather and the amount of shade in summer...We don't really use any evaluation tool in my department." Since there is no consensual standard, assessment of the courtyard activities becomes very subjective. The administrator puts it, "I just look at it. If I see it, I look at it periodically. If something comes to my mind and catches my attention, and I don't like what I saw, I will say let's look at something else. What I concern is not an activity per se; it is the safety of the activity...If I cannot see them from outside of my window, I don't evaluate it. There is no set time or a structured schedule for me to check activities."

3) Outdoor policy

There is no written policy regarding use of the courtyard at Golden Age. Some dos and don'ts are decided by the administrator, most of which are related to residents' safety and security. For

example, residents are not allowed to use the front patio at the main entrance because the administrator felt that residents might walk out of staff's sight and wander onto the streets. Other guidelines for courtyard were developed long time ago and were taken for granted. "It has been always in that way", the administrator said. One example is the open hours of the courtyard, which was set even before the current administrator came in to the office.

Availability of the courtyard:

Availability of the courtyard is perceived differently. According to the administrator, the courtyard is open 24/7 and the automatic door with a wheelchair touchpad is kept unlocked. People are allowed to smoke in the courtyard anytime they like. When it rains, smokers may stand under the eaves at the entrance. In winter, staff are asked to shovel an area in front of the entrance so residents can smoke outside. The administrator mentioned, "If a person likes to walk at 2 or 3 am in the morning and if the weather is permitting, staff will have them sit outside." The director seems to have different understanding. She said, "I believe that the doors of the courtyard locked at 10 or 11pm at night. It opens early in the morning next day. That again is for resident safety's sake."

It is highly dependent on the availability of individual staff to take bedridden residents to the courtyard. If residents make a request to use the courtyard, it is usually activity staff rather than CNAs to bring residents outside. However, given limited activity staff (one activity director and one activity staff), a one-on-one activity rarely happened unless the resident is agitated and need a particular attention.

Safety:

Staff or family members have to escort residents with dementia or disorientation to the courtyard. Independent and mobile residents have free access to the courtyard. Staff are required to check outdoor residents on a regular basis. However, during the observation period, staff rarely showed up, and no passerby staff used the courtyard as a shortcut to travel between two corridors. Most of surveillance was carried out by activity staff monitoring outdoor users from the inside.

An electronic bell is installed at the automatic door for people to contact indoor staff. There is no emergency communication device in the courtyard. Therefore, it is very risky allowing residents to use courtyard at night because the nurse-resident ratio is 1:51 and less than one nurse aide on the evening shift per day (Wisconsin Department of Health Services, 2013); there is not enough staff to keep eyes on outdoor users or escort residents to the courtyard at night while taking care of indoor residents.

Outdoor eating, smoking & feeding animals:

Rules of outdoor eating are not specified. During the observation period, no one picnicked in the courtyard although food is not prohibited. One possible reason as discussed in Chapter 5 is that the courtyard is poorly furnished and there is no table to place food.

A BBQ grill at the courtyard was used by staff for 4th of July or other cookout events; however, no outdoor seats were set up for the activities. Hence, foods are cooked outside and were brought in for residents. It is possible that organization attempts to limit outdoor eating so no appropriate furniture is provided. Another reason is that they have no budget for outdoor table and chairs sets.

Eating lunch at the dining room is just taken for granted. No furniture cues outdoor eating behavior; staff have no attempt of encouraging residents to make a request.

Residents are allowed to smoke in the courtyard. Staff and resident smokers (who tend to be more independent and mobile) are allowed go out to smoke anytime they like, and anywhere they prefer in the courtyard. Four movable ashtray stands are placed at the patio.

Residents are allowed to feed birds with leftover breads. During the observation period, breadcrumbs were spread on the ground. No maintenance or housekeeping staff would try to sweep the bread away.

Change of environments:

Residents are allowed to make light changes to the courtyard with director's permission. They sometimes helped water plants and weed garden space. Wheelchaired helpers would have to bend

body down to trim plants on the ground. No outdoor safety protocol can be followed so most of the time, it is the director's decision to approve or reject resident's request.

Residents are not allowed to pick up and taste tomatoes right away. According to the administrator, residents with dementia may pick up something and eat; some of them could have issues of swallowing food. Garden-grown vegetables have to be processed in the kitchen first.

3. Linkage with the experiential attributes

Figure 6-3 shows comparison of organizational audit scores. Overall, the administrator perceived a better performance of organizational components in shaping the nine attributes (mean = 3.36). Five attributes: "Privacy", "Social interaction", "Accessible space and built features", "Sensory stimulation", and "Safety and security" were assigned a higher score than those in the researcher's evaluation. From the administrator's perspective, organizational resource and policy support the courtyard as a quiet and accessible place that accommodates social interaction and sensory experience in the maximum of safety. Other aspects seem not to be the first priority.

A much lower score was assigned by the researcher (mean = 2.44). Most of the attributes which score relatively higher in the administrator's evaluation are below-average from the researcher's perspective. A lack of amenities and policy clarification is a major reason. Inadequate support of education or training programs may be blamed for low achievement in "Awareness and orientation", "Sense of ownership" and "Participation in meaningful activity". Staff have little knowledge of utilizing existing resource to create a meaningful and participative setting.

One unique feature of this courtyard is that because of ambiguous rules, residents have more flexibility to continue a life-long habit such as feeding birds with bread and weeding garden space. Since staffs rarely intervene, residents are provided with more freedom in the courtyard.

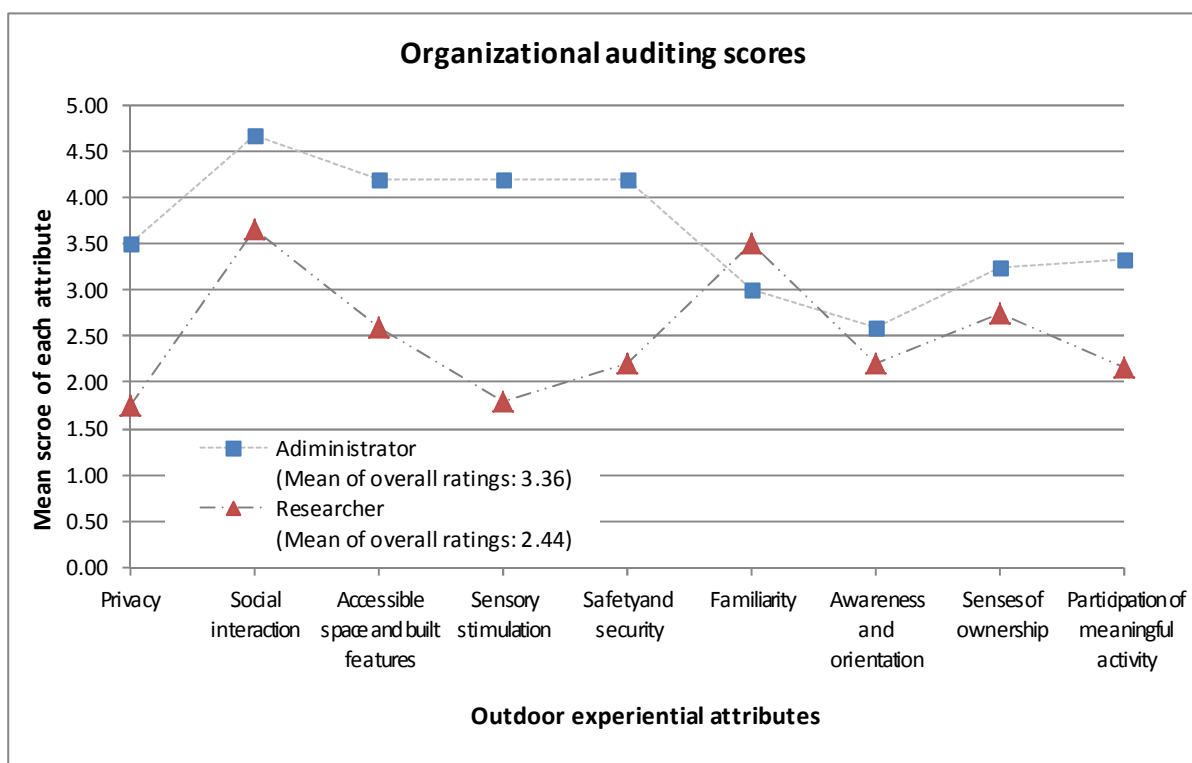


Figure 6-3. Auditing scores of organizational aspects of the courtyard at Golden Age

B. Staff-resident relation in outdoor programs

This section describes overall Golden Age's staff resource and staff-resident interactions in the courtyard. The former presents results of evaluation using the Resident and Staff Information Form (RSIF) and the latter introduces resident influence and staff responsibility.

1. Staff in the facility: variety and training

Golden Age has a relatively low RSIF score. It provides 69.2 percent²⁴ of staff resources listed in the RSIF. The facility has two physicians, one occupational/ physical therapist, one social worker and three recreational therapists (one activity director, one regular staff and one activity assistant). No psychologist or clergymen is available. Ninety percent of the staffs have worked here for more than 12

²⁴ A total of nine out of 13 staff resources are provided; $9 \text{ (total score)} \div 13 \text{ (a maximum of possible points)} = 69.2\%$

months in 2013. Eighteen percent of the staffs are male. No staff speaks languages other than English. There is only one type of in-service training program.

There are four different volunteers, each of which spends four hours per week on activity. That is, each resident shares approximately 0.31 volunteer-hours per month.

2. Resident influence and staff responsibility

Golden Age has a top-down decision-making process related to the courtyard. The director is the major caregiver and is eager for taking full ownership of the courtyard.

1) Gardeners of the courtyard

Planning & funding:

The administrator, who has worked here for almost 10 years, recalled that the courtyard has not been changed since she was here. The activity staff witnessed some changes of the courtyard; a fountain and garden space that were originally placed at the front patio at the main entrance were moved to the courtyard at least 10 years ago. The current administrator and activity director came on board after the change.

Garden space of the courtyard is planned by the activity director with some resident input. The director stated “Well, I just basically assumed the same responsibility the previous activity director has; it is to plan and maintain the garden.” The administrator is not interested in how garden space is maintained and planned every year. She put it, “I don’t know if I play a role in that. I just make sure that people are safe and using it appropriately.” The director strived to get donation or make fundraising because there is no annual budget for the courtyard from its corporate. The administrator explained, “limited amount of funds can be used every month; money goes to the dietary department, housekeeping, maintenance and any aspects related to safety, and at the end, there is no budget for the courtyard”.

Given no financial support, the pond in the courtyard is not well-maintained, and cracks of pavement are not fixed. Plastic chairs are major outdoor furniture that can be offered. The garden space is supported from fundraising and donation by staff, family members and nurseries. The director herself also donated some perennials. “We do our best with what we have”, she said.

In spring, the director usually leads a garden planning group. Residents’ preference of plants is inquired during the meeting. “Last year, they gave me their suggestion of tomato plants and pepper plants. Some of them want to plant corns, and I said, “I don’t know if we have space for corn.” Plants are purchased based not only on residents’ comments but also on the budget. She stated, “I was the one who picks up flowers and vegetables. The cost decided what I can purchase with the amount of money I have from fundraising.” Topics related to selection of plants are not brought up in resident councils constantly; residents who attended meetings in May and June are more concerned about when they can go out to have outdoor activities.

Planting & maintaining:

The director takes charges of garden space. Maintenance staff cut grass and trim shrubs. The director stated, “I do the planting, watering, and weeding and residents watch.” After plants are purchases, she usually set up a planting day in May and transplants flowers to the garden with some help from volunteers. “I basically plant all the flowers you see in that garden and the vegetables which we tried to grow since last year. We actually have a planting day in spring. Last year, we planted flowers with help of Red Hat Society ladies. They donated hanging baskets and also helped us to plant herbs and flowers as you see.” Her activity staff is not a green thumb; she only helps water plants. Weeding is also one of director’s jobs. When weeds grow rampantly, one or two residents who have strong upper limbs help do weeding. “We have several residents who had their farms. When they look at the garden, they think back to their time of working on the farm. Given the garden, they bring that experience to the

present and they enjoy watching and gardening.” One issue is that the garden space is in ground level and gardening may put wheelchaired residents at the risk of falling.

The director perceived residents as her supervisor. She put it, “When I brought them outside or they happened to see me working in the garden, they liked to sit in the dining room and watched. When I came to the door, they made comments right away.” Some residents liked to make sure that everything is under control. The director mentions, “There was one man last week and he worried that green peppers are dying. He was afraid that we are receiving too much rain, and water may hurt pepper plants. I had to show him that everything’s fine and told him that they aren’t quite ready yet to come out from the vine.” The activity staff also recalled, ““We had rain one day and they yelled. “You have to go and do this.” That is what they do. This is built in them. They always say, “This got to be done and that got to be done!””

The residents’ attempt of managing the garden reflects desires of creating their ideal garden, which they learned through life-time experience of being gardeners or farmers. Despite of physical disability and inaccessible environments, they made staff to perform their requirements and maintain a garden that ought to be done. They may guide staff to change the courtyard, and their expertise sometime made them more dominant in staff-resident interactions. Staff comments, “One year, I can’t get things to grow. A resident with a farm introduce me to grow winter grass. I don’t know there are plants that can grow in winter!”

Changing the courtyard

The residents, administrator, and activity director initiated changes to the courtyard. Residents usually made slight and temporary changes like arranging furniture, bringing one’s own chair and spreading breadcrumbs for birds. These changes require no permission from staff. Weeding requires staff approval and piles of dead plants and dry leaves after weeding are cleaned up by staff. According to the director, residents expressed that they want a vegetable garden in resident councils. To meet their

need, a vegetable garden was created in summer 2012; some tomato pots were purchased through fundraising, and pepper plants were donated by a nurse's mother.

Permanent changes were initiated by the administrator. The administrator asked maintenance staff to tearing down a gazebo and a raised box few years ago. The director recalled, "The covered gazebo was removed and we place patio tables there. That gazebo used to provide a shelter for smokers during winter time...I think there are also some safety issues that residents are being outside too long. There were possibilities that residents slip or fall on the snow during winter time, which I think is a valid concern. "In addition, the raised box was in need of repair. Given no budget, it became a huge ashtray filled with cigarette butts so it was tore down by the administrator's request. The administrator also asked maintenance staff to remove shrubs so "the courtyard would have more grassy areas and residents can use it when we have a picnic out there," the administrator said. However, according to the director, these changes were conducted without consulting with her.

The director was the main person to decide courtyard decoration. Two bird houses painted by residents were hung under the eaves. There is no birdfeeder brought by residents from home. The director has proposed some changes before; she wrote an email to the administrator and asked for a meeting. However, she found that the administrator was very busy, and it was very difficult to meet with her; if they had a chance to talk, the administrator usually had a passive attitude toward the change.

2) Ownership of the courtyard

Ownership of the courtyard is perceived very differently. The administrator felt that residents own the courtyard, and staff just oversee it. However, residents have very few opportunities to make decisions for the garden in reality.

The director believed that the activity department had the ownership until 2013 when the new company bought the facility; the department's (or her) ownership of the courtyard was removed because everything was on hold by the new corporate. The new owner, as commented by the director,

may have a new plan for the courtyard, and she had no voice in that. The director felt that she had put so much effort in the space but “nobody realizes how hard it is to maintain a garden.” She further stated that, “The courtyard and garden was a part of me...I like to resume my ownership; however, I haven’t been told or heard that the new corporate is going to keep the courtyard. If I put efforts now and my work is going to be eliminated, I will be hurt emotionally because it is a dignity issue to me.” She felt nobody really has ownership of it.

3. Support of the experiential attributes

Figure 6-4 illustrates audit scores of staff-resident relations. The activity staff assigned a low score to most of the attributes in general (mean= 2.73). Three attributes: “Familiarity”, “Sense of ownership” and “Participation in meaningful activity” were assigned only two points. From her perspective, inadequate training, a lack of extra help from other departments and insufficient resources make the courtyard less individualized and meaningful. However, these attributes, from the researcher’s view, are not as repressed as what the staff thought they would be. Given vagueness of outdoor rules and loose management, residents were able to do what they used to do at home. They can feed birds, do weeding, water plants and smoke without going through the administrator’s censorship. Activity staff act as enablers to facilitate activities. For example, staff lifted wheelchaired residents to go through a threshold. A vegetable garden was created by a residents’ request.

The attribute “Social interaction” seems to be overrated in the staff assessment. Residents who are less mobile require staff assistance in transportation; inaccessible physical settings aggravate the dependence. If staff is busy, spontaneous social activities are less likely to be initiated by wheelchaired residents.

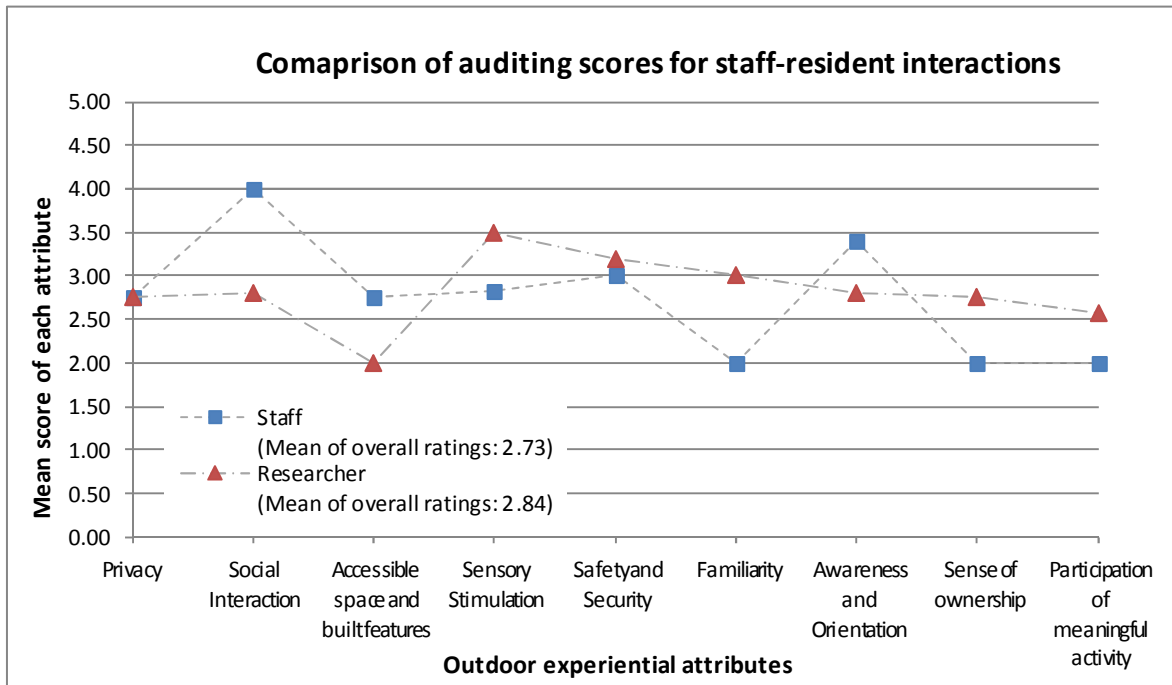


Figure 6-4. Auditing scores of staff-resident relations in the courtyard of Golden Age

C. Resident profile

1. Demography and background

Golden Age had 51 residents in 2013. During the observation period, staff reported that only one percent of the residents paid fees with Medicare and 99 percent with Medicaid. The majority (84.3%) had a high-school diploma and very few had education less than high school (5.9%) or more than a college degree (9.8%). Approximately 60 percent of the residents are either unskilled laborer or blue-collar workers. A male-female resident ratio is 55 to 45, which is unusual comparing to other long-term care facilities in general. The facility has a younger population than the other two nursing homes; an average age of the residents is 77.5. It's equally distributed across the four age groups (less than 64, 65 to 74, 75 to 84, and 85 and over).

Residents of Golden Age are heterogeneous in ethnicity and religious orientation. Whites make up for 51 percent of the residents. Approximately 45 percent are Black and four percent are Hispanic.

Some residents are Catholic or Protestant (37%) and others are from different religious background (63%). None of the residents was born in other countries other than the United States. Two persons have Spanish as their primary language; they do not speak English well enough to communicate with staff.

According to the activity director, about 90 to 95 percent of the residents had experiences in gardening. She stated, "Some residents worked in a farm or a green house. Other residents either had experience in their parents' garden or help their wife or husband in managing gardens."

2. Functioning and activity participation

The majority (86.3%) of residents suffer from moderate or severe dementia. Approximately 71 percent do not know what day and year it is. In terms of physical disability, over 70 percent use wheelchairs, and 19 percent have poor upper-limb strength that may cause difficulties in gardening or other activities.

Most of the residents are able to make some daily activities like grooming, eating, dressing and getting in and out of bed (Table 6-6). Other activities that demand more cognitive and physical efforts (e.g., walking, bathing, handling money and shopping) cannot be carried out by most of the residents even with assistance.

Table 6-6. Percentage of the residents in carrying activities of daily living in Golden Age

		Number who do this without help	Number who do this with some help	Number unable to do this
1.	Grooming	55%	16%	29%
2	Eating	63%	22%	15%
3	Dressing	63%	12%	25%
4	Walking	8%	25%	67%
5	Getting in and out of bed	51%	12%	37%
6	Bathing	0%	0%	100%
7	Toilet	6%	12%	82%
8	Communication	47%	45%	8%
9	Handling money	0%	0%	100%
10	Using a telephone*	8%	59%	2%
11	Shopping	0%	0%	100%

* Some residents do not have anyone to call so they have no use for a phone

Over 80 percent may have issues of getting to the bathroom on time. To allow residents to use the courtyard without fear of incontinence, a bathroom near the courtyard space becomes very critical. Unfortunately, the closest public washroom is for visitors; if outdoor users need to go to the bathroom, they have to go back to their rooms.

In terms of leisure activities, most of the residents watch TV or participate in programmed activities in a typical week during summer (Table 6-7). Outdoor activities such as taking a walk, and sitting outside at the courtyard are not very popular. Only five percent of the residents do some light gardening.

Table 6-7. Percentage of the residents take part in the following activities in a typical week in Golden Age

1	Watched TV	100%
2	Listened to music	31%
3	Read a newspaper or book	10%
4	Wrote	2%
5	Sewed or knitted	0%
6	Played cards, checkers, chess, or a similar game	10%
7	Played pool, bingo, or dominoes	33%
8	Drew or painted	12%
9	Engaged in ceramics or other hobby	10%
10	Took care of plants or gardened	5%
11	Went outside and sat at the courtyard	4%
12	Took a walk*	24%
13	Outdoor programmed activities like games, exercise group and trivia/current events	63%

* Indoor or outdoor walk

3. Resident experience of home garden and gardening

Sixteen residents were selected by the activity director to participate in the interviews regarding home garden experience. One resident withdrew from the beginning of the study; a total of 15 residents (six females and nine males) completed interviews. The average age of the group is 75 years ranging from 60 to 93. Their occupational background is relatively consistent with the majority of general labor. Half of the group is wheelchaired. Approximately 40 percent (six people) may not know what day and year it is. Approximately 60 percent (nine people) would participate in scheduled activities more than three times a week.

The interview data was processed and analyzed in the same way as they were done for Silver Life. Results show a similar pattern across the two facilities, although fewer themes were discovered at the Golden Age. Nine major themes were identified including 1) garden rules, 2) a shared garden, 3) food bank, 4) sensory experience, 5) a nature lab, 6) competing with nature, 7) hard work, 8) feedback,

and 9) my home. Sub-sets can be found under each theme and are listed in Table 6-8 with example narratives and frequencies. A complete list is provided in Appendix M.

Overall, themes like “sensory stimulation”, “my home” and “rules of gardens” were frequently mentioned, followed by “competing with nature” and “hard work”. Topics related to “a nature lab” and “shared gardens” were less mentioned.

Table 6-8. Major themes and their frequency emerging from resident interviews in Golden Age

Major themes	Sub themes (# of frequencies)	Example narratives
Rules of gardens (43)	Following rhythms of seasons (10)	<ul style="list-style-type: none"> • In September, you cover soils. After winter, snow melts. You start to dig holes
	Principles of better gardening (20)	<ul style="list-style-type: none"> • I used to rotate the garden because of the soil. You certainly don't want everything back to take all nutrients.
	Family teamwork (13)	<ul style="list-style-type: none"> • My wife took care of the garden and I mowed the lawn and pulled the weeds. I had to move rocks so my wife could grow tomatoes.
A shared gardens (18)	Family first (5)	<ul style="list-style-type: none"> • I had four kids. We ate most of plums and vegetables.
	Sharing food & information (13)	<ul style="list-style-type: none"> • I had some gladioluses. They made a nice bouquet. I would put on my dining table or I would use that as a present to my friend.
Food bank (22)	Food bank (22)	<ul style="list-style-type: none"> • My father used to plant beans and cut them and send to the factory to can...We had chives and a lot of apple trees and cherry trees.
Sensory experience (81)	Beautifying the house (12)	<ul style="list-style-type: none"> • I had a lot of tulips, pansies and begonias. The beauty of the garden was my motivation of doing garden.
	Interactions with pets or wild animals (20)	<ul style="list-style-type: none"> • I had deer in my garden because I used to live by the river, and deer live by the river. Sometimes they came in and I was in the garden, they were looking at me. I said, “Oh! Hi”.
	Cooking from the garden (49)	<ul style="list-style-type: none"> • We also had white and dark-purple lilacs. They had a very strong fragrance... My grandmother used to cook them and put milk in them. I didn't like their taste.
A nature lab (14)	Gardening as trial and error (7)	<ul style="list-style-type: none"> • Nobody taught me. I just tried it and did it. If it worked, I just kept doing in that way. To me, gardening was just so basic.
	Unpredictable gardens (7)	<ul style="list-style-type: none"> • I got mints growing all over. I didn't plant mints though. They grew by themselves. I sometime made mint teas.
Competing with nature (23)	Battling with the uninvited (20)	<ul style="list-style-type: none"> • Dandelions are a killer. You have to take them out. I got very upset if they came back.

	Weather factors (3)	<ul style="list-style-type: none"> • If the weather is too bad, you have to think about how you balance it or how you reduce the loss.
Hard work (30)	Investment of time and effort (12)	<ul style="list-style-type: none"> • Sometime I spend in the garden all day long. One time my neighbor told me, "If I follow what you did for ten minutes, I will be on my bed for a week." She had a backache.
	Starting from scratch (18)	<ul style="list-style-type: none"> • I created the garden by myself. I dug them all and put seeds in there. I took care of the garden by myself too.... I always had a big garden.
Feedback (21)	Self-value & satisfaction (17)	<ul style="list-style-type: none"> • People used to knock my door or stand by my door and said, "God! That is beautiful."
	Physical health (2)	<ul style="list-style-type: none"> • Gardening was a very good exercise to me. Plus, you can some fresh air.
	Relaxation (2)	<ul style="list-style-type: none"> • I felt relaxed when sitting in my garden.
My home (50)	Family tradition (4)	<ul style="list-style-type: none"> • My wife taught me how to garden. She is good at it. Her parents taught her how to garden. Her parents were great gardeners.
	Dwelling and resting (15)	<ul style="list-style-type: none"> • We had a screen-in porch. In summer, we would put chairs and sit on the porch.
	Playground (5)	<ul style="list-style-type: none"> • Do you know t there is a "Big Boy Tomato"? They are so big. They are one of beef steak tomatoes. They are so big. They would fall over and my dad would just plow them over. We would run down, pick them up and wash them. We would put some salt and eat them (laughing). We liked that.
	Gardens as part of life (18)	<ul style="list-style-type: none"> • My dad used to have a thousand of chickens. He would sell them when they grew up. They would lay eggs and those were our income.
	Home at present/self at present (8)	<ul style="list-style-type: none"> • I miss my garden but I have to accept that is long gone. I miss the pine tree that we used to make decoration. I miss that we could do something.

Interviewees from Golden Age are younger but are less capable in terms of communication comparing to their counterparts at Silver Life. Both groups showed more enthusiasm in topics of "cooking from gardens", "food bank" and "battling with the uninvited". Themes like "beautifying the house" and "family teamwork" are much highly weighted at Silver Life while "interactions with pets or wild animals" and topics related to practice of gardening like "principles of better gardening" and "starting from scratch" were paid more attentions at Golden Age.

Another difference is that subjects related to “gardens as a part of life” was discussed with much greater stress on emotional attachment or everyday life routine among Golden Age residents. Allie (GA1²⁵) cried when she described friendships with her cat and processes of how she buried the cat in her garden. Erin (GA3) still remembered how her parents raised the family with home-grown vegetables and livestock; “My mom raised chicken, red and white Leghorn chickens. She would pick up white eggs and brown eggs every day... We had cows, Jersey cows. They had white face. We used to milk them... My dad would sell the milk but he didn't have much to sell.” Judy (GA9) showed strong attachment to her grandparents; her reminiscence of a home garden was about her childhood in grandparents’ house and their care. She mentioned, “My nana took care of me. She was a good gardener and cook. She used to make donuts and save the hole for me. I would put in a paper bag... My grandfather was a farmer. In the backfield way up to a pine tree, there were some flowers. You cannot pick them up anymore because they were indigenous. Only few of them were left, and people want to preserve them. When I was a young lady, we used to make baskets. We would pick up flowers and put in baskets but you cannot do that anymore...”

A new sub-theme, “playground”, was developed and categorized under “My home”. It describes how a home garden was treated as a playground. Erin (GA3) stated, “Do you know t there is a "Big Boy Tomato"? They are so big. They are one of beef steak tomatoes. They are so big. They would fall over and my dad would just plow them over. We would run down, pick them up and wash them. We would put some salt and eat them (laughing). We liked that. It was fun.” The “fun” part of a home garden is related to spontaneous entertainment or creation of something from natural materials. It also implies a very close family relationship in playing, cooking and eating together. Judy (GA9) remembered many details of stories about playing in gardens and farms; she stated “My grand grandfather was a farmer too. He has a twin brother. They married sisters. I was just a little girl. He used to make a crown of

²⁵ “GA1” means #1 interviewee of Golden Age (a complete list of the interviewees, see Appendix N)

dandelions for me. That was funny. They are weeds. When you blow the flowers, they fly... My brother, when he was a kid, he used to eat corn like a typewriter (laughing). It was funny. He loved corn.”

III. Elderly Living Nursing Home

This section provides overall organizational contexts and organizational aspects of the courtyard. The former describes results of evaluation using the Policy and Program Information Form (POLIF) and the latter introduces three organizational dimensions of the courtyard: mission & philosophy, outdoor activity programs and outdoor policy.

A. Organizational context

1. Facility's policy, care program and resources

Elderly Living is a for-profit organization owned by a large nursing home chain company. The facility is licensed and Medicare & Medicaid certified. Initial entrance fee is not required. Services provided in the facility include room, board, cleaning, personal care, nursing care service, therapy & rehabilitation and recreational activities. There is no minimum age requirement for admission.

The administrator supervises several departments including long-term and short-term nursing care, life enrichment service, life support (e.g., resident advocacy, caregiver education, and financial resource), social service, therapy department, dietary service, business administration, human resources and maintenance. The organizational structure is characterized by clear division of top-level, middle-level and front line workers, giving a more hierarchical role layer than that in the other two nursing homes. Communication across departments relies on a formal staff meeting every day.

The facility runs in day shift with a nurse–resident ratio of 1:9 and aide–resident ratio of 1:8 (Wisconsin Department of Health Services, 2013), which is the highest ratio among the three cases. Approximately 64 percent of full-time nurses and 59 percent of full-time nurse aides are employed for at least one year in 2013.

An overview of Elderly Living’s organizational background is analyzed on the basis of POLIF’s eight organizational dimensions. Based on the scoring system developed by Moos & Lemke (1994), Elderly Living excels in “daily living assistance”, “health services” and “policy clarity” but falls behind in “acceptance of problem behavior”, “resident control” and “room privacy” (Table 6-9).

Table 6-9. Elderly Living’s scores of POLIF

	Expectations for functioning	Acceptance of problem behavior	Policy choice	Resident control	Policy clarity	Room privacy	Availability of health services	Availability of daily living assistance
Score	0%	31.25%	68.42%	58.62%	87.5%	50%	87.5%	92.86%

1) Expectations for Functioning

Based on the POLIF’s scoring system, the Elderly Living has zero percent²⁶ of expectations for functioning. It takes residents who are unable to feed themselves, bathe and groom. It accepts people with confusion and provides interventions for depression.

2) Acceptance of Problem Behavior

The facility has low acceptance of problematic behaviors. It accepts 31.25 percent²⁷ of types of problem behavior listed in the POLIF. Residents are allowed to refuse to participate in activities or to take prescribed medicine. Behavior like taking medicine other than what is prescribed, wandering around the building at night, refusing to take a regular bath and creating disturbance are discouraged and will be intervened. Intolerable behaviors include being drunk, leaving the building without informing staff, stealing, damaging property, attacking staff and residents, verbally threatening others and indecently self-exposing. A person who persisted in such behavior might be asked to move out.

²⁶ A total of zero out of 11 expected functioning items are found; $0 \text{ (Total score)} \div 11 \text{ (a maximum of possible points)} \times 100 = 0 \%$

²⁷ A total of five out of 16 types of problem behavior are acceptable; $5 \text{ (Total score)} \div 16 \text{ (a maximum of possible points)} \times 100 = 31.25\%$

3) Policy Choice

Elderly Living allows a relatively low degree of autonomy. The facility has 68.42 percent of policy choices 28 listed in the POLIF. Residents are given an hour range during which residents can choose to have meals. Visiting hour is flexible but there is a “curfew” (a time by which all residents must be at the facility in the evening). Residents are encouraged to bring their own furniture for their rooms. They are allowed to keep a fish or bird in their rooms, do light laundry in the bathroom, drink a glass of wine or beer at meals and skip breakfast to sleep late. Drinking liquor in one’s room is discouraged; keeping a hot plate or coffee maker in the room is intolerable.

4) Resident Control

Elderly Living supports resident’s participation in decision-making. It presented 59 percent²⁹ of means in participation listed in the POLIF. There is a resident council with more than four percent of residents on it. Residents are able to be a part of a house meeting or resident committee. Residents are encouraged to decide programmed activities, new activities that will occur in the future and move a resident from one bed or room to another with staff input. Residents are consulted for menus, mealtimes, visiting hour, decoration, handling residents’ complaints and rules about the use of alcohol but staff make the final decisions. Policy related to dealing with safety hazards, deciding whether a resident will be asked to leave and changes of staff is completely decided by staff.

5) Policy Clarity

Elderly Living provides 88³⁰ percent of means of policy communication listed in the POLIF. It offers an orientation program for residents and staff, a once-a-month newsletter and a bulletin board

²⁸ A total of 13 out of 18 rules are provided; $13(\text{Total score}) \div 18$ (a maximum of possible points after subtracting one n.a. from 19) $\times 100 = 68.42\%$

²⁹ A total of 17 out of 29 means are provided; $17(\text{Total score}) \div 29$ (a maximum of possible points) $\times 100 = 58.62\%$

³⁰ A total of seven out of eight means are provided; $7(\text{Total score}) \div 8$ (a maximum of possible points) $\times 100 = 87.5\%$

for residents to announce or receive information. There is formal staff meeting once or twice a month and a regular staff assembly every morning.

6) Provision for Privacy

Elderly Living provides 50 percent³¹ of privacy-related items listed in the POLIF. Less than 50% of residents live in a private room. Three residents at most share one room. Some bathrooms are shared by four residents. There is no individual mailbox but a private dresser is assigned to each resident. A bedroom door is allowed to be closed but disallowed to be locked. A private and closed office is provided for interviewing residents.

7) Availability of Health Services

The facility offers 88 percent³² of health services list in the POLIF, which includes regularly scheduled doctor's visits, doctor on call, assistance in using prescribed medications, physical and occupational therapy and psychotherapy or personal counseling.

8) Availability of Daily Living Assistance

Elderly Living provides 93 percent³³ of daily living assistance list in the POLIF. It comprises legal advice, barber service, and assistance with banking, handling spending money for residents, housekeeping, grooming, laundry and shopping. Each meal is provided every day. Snacks are served in the afternoon on a typical day. No transportation (e.g., minibus or pickup car) is offered.

2. Organizational aspects of the courtyard

1) Mission and philosophy

The mission of the organization as shown in the facility webpage is to “help people live better by providing quality, cost effective health care and rehabilitation primarily to seniors in a resident directed

³¹ A total of five out of 10 privacy items are satisfied; $5 \text{ (Total score)} \div 10 \text{ (a maximum of possible points)} \times 100 = 50\%$

³² A total of seven out of eight health services are provided; $7 \text{ (Total score)} \div 8 \text{ (a maximum of possible points)} \times 100 = 87.5\%$

³³ A total of 13 out of 14 types of assistance are provided; $13 \text{ (Total score)} \div 14 \text{ (a maximum of possible points)} \times 100 = 92.86\%$

environment.” The administrator further explained roles of the courtyard in the mission, “I absolutely see organization emphasized more on outdoor environments because the whole philosophy and the mission are to enhance the life of the people that we take care of. Providing the courtyard is just one way that we enhance that for residents.”

Besides quality of life, safety and cost-effective leisure are also targets. She mentioned, “Outdoor space would be important to residents who have difficulty in getting out and all of these restriction based on mobility issues. Having courtyard space allows them to get outside and to enjoy fresh air without necessary to leave the facility and special transportation...it gives areas that people can go away from usual day to day settings. If their units are very active or noisy at that day, the courtyard will be a nice place to go and read and relax in nature.” In this regard, an ideal courtyard space to the organization is a place that has serenity and peacefulness and helping balance over-loaded stimulation without adding staff workload.

A set of prerequisites of this ideal nature is very difficult to meet. For example, it requires independent users who are able to utilize the courtyard with little staff assistance. It requires accessible physical environments and flexible policy that allows spontaneous courtyard visits. In other words, it depends on a very autonomous environment.

In addition, the ideal courtyard seems to be too passive; it focuses on balancing sensory overload but excludes its potential of increasing perceptual and cognitive stimulation. It also simplifies resident’s need and omits desires of individualization and personalization. In other words, the ideal courtyard may not be ready to deal with residents who want to take an active role in decision-making processes.

2) Outdoor activity program

The availability of outdoor activity is based on staff’s judgment on the weather and resident’s preference. It is very spontaneous and changeable so courtyard activities are not marked in summer

calendars at Elderly Living, although outdoor activities will eventually be arranged. The director explained, “I don’t have the courtyard listed in activity calendars. If the weather is permitting, we can actually do everything in our courtyard.” Activity staff think that “it depends on the day of whether residents want to go out...whether they have extra help in transportation” if two factors are not satisfied, they will just keep activities indoor.

One might raise a question on what standard/ protocol is applied to the decision of not having an outdoor activity. Subjective judgment may vary from one staff to another.

Scale and operation

The scale of a staff-lead outdoor activity depends on the event content. A music performance may draw 30 residents and lasts for more than an hour. In such scale, transporting residents is teamwork among activity staff, CNAs and even managerial staff. A small social event like happy hour could have 10 to 15 participants and take 30 to 45 minutes. Fifteen minutes before and after an activity are reserved for transportation by two activity staff. One of activity staff said, “We only bring residents outside when we have extra help; two of us have to get snacks and drinks, and clean up garbage after activities. To have successful programs, we need helps from volunteers or CNAs so activity staff can set up the place. It is just not easy as everybody thinks it is.”

According to activity staff, the organization encourages them to participate in continued education, learn new things and try new activities in the courtyard; however, organization may not fully reimburse the trip. The conference they went last time was hosted by Alzheimer’s Association but it was not specific to outdoor leisure. They felt that resources to develop expertise around horticultural activities or gardens for people with dementia are lacking.

Types of activities

Two types of programmed outdoor activities were found in the courtyard. One is related to an activity that requires bodily movement such as ball toss, and the other includes different forms of social

events such as a happy hour and music concert. Either type of activities is compatible with an indoor (e.g., the dining room or activity room) and outdoor setting. Therefore, it is staff's call to decide whether an activity is carried at the courtyard.

Gardening is not a regular structured outdoor activity although there is a wheelchair-friendly raised bed. The activity director explained, "The majority of them like just go out and enjoy flowers visually...it is a seasonal thing; we do more gardening in spring and just water and enjoy flower in summer time." The gardening activity is a one-day event every year. After planting day, no more gardening is scheduled. Both director and staff express that they are neither green thumbs nor are interested in gardening; limited knowledge may make activity programs characterized by fewer gardening opportunities.

Evaluation of activity programs

Activities in the courtyard are not evaluated. The director explained that two major factors determine a successful outdoor program: teamwork and weather factors. These two factors, from her perspective, are hard to control and thus make evaluation infeasible.

One thing that is tracked is activity participation; it is required by the facility's care plan and also state regulation. The records help staff to track residents' participation. If some residents have more spontaneous and individual outdoor visits but refuse to be in staff-led programs, they will be given more flexibility, and labeled as "an outdoor-patio person".

The administrator evaluates an outdoor activity by attendance and resident feedback. "The number of participants and their feedback help us improve or modify the program...We ask people reasons for not coming to an event. As you know, the facility takes many rehab residents; they may feel tired after an all-day physical therapy. If we have a decent number of attendance (around 20 residents) and good feedback, we will continue the outdoor program." Her attitude reflects that residents have little decision-making authority.

3) Outdoor policy

The policies that define use of the courtyard, according to the administrator, reflect “happy balance between safety and keeping residents as less restrictive as possible.” Some policies are decided in staff meetings across departments including rules regarding availability of the courtyard and individual-based behavior management. Others are decided by the administrator such as rules related to change of the courtyard.

Availability and safety:

According to the administrator, the courtyard opens 24/7. An alarm is turned on in the severe weather. Residents are not encouraged to use the courtyard at night; “we cannot really tell residents “you are not allowed to use the courtyard at night.” However, if residents make a request, nurse aids will bring them to the outside and stay with them for a very short time. During the day, staff are required to check courtyard users regularly. The administrator stated, “Lots of people can go out on their own. They don’t need staff’s nearby supervision. The courtyard is enclosed so no one can wander off or get away from the building without letting us know. Besides, we do monitor it to make sure people are safe...Staff check them every hour in the courtyard.” However, staff did not make a regular visit during the observation period. Some people were left in an extreme hot weather for few hours. The safety policy does not seem to be translated into staff’s practice.

Activity staff are expected to bring residents who are not self-propelled to the courtyard once in a while. The director notes, “There are some one-on-one activities. Staff bring somebody to the courtyard for ten minutes every so often and bring another one...I try to have some volunteers. They also help bring individual residents out.”

Smoking & outdoor eating:

There is a written policy prohibiting smoking in the courtyard. . If residents want to smoke, they have to go to the sidewalk. Rules of outdoor eating and interacting with animals are not specifically

defined. Residents are allowed to picnic in the courtyard; they can enjoy some snacks prepared by staff or family members. Having lunch at the dining room is taken for granted; staff did not offer the choice of lunch in the courtyard, and no appropriate or adequate furniture accommodate the activity either. As a result, residents are less likely to make a request on having meals outside.

Change of environments:

Any change of environments requires the administrator's approval. "The facility wants to know what is grown and what residents may get into it," the director said.

The administrator is hesitant to encourage residents' spontaneous gardening. "If they are very capable of it, gardening will be very nice for people who are very interested in it. Sometime it is a safety issue. Residents may get wet or fall from a wheelchair. Last year, we had a lady with dementia who loved to be out there; she is the one who wanted to do gardening. We took her out there. When she pulled hoses and got water all over the place, we became nervous because the hoses may trap other people. We had to watch her very closely to make sure she got enjoyment and everybody was safe as well. Whenever she was watering, we have to be out there." In other words, visual appreciation of nature is preferred because it is the safest activity and requires little staff supervision.

Although no written policy prohibits placement of personal furniture or decoration in the courtyard, it is very likely that one has to get the administrator's permission first.

3. Support of the experiential attributes

Figure 6-5 shows organizational audit scores. Overall, the administrator scores higher in self-evaluation in organizational performance (mean= 4.41) comparing to scores given by the researcher; almost all dimensions scored between four (very good, could be improved) and five points (very successful). Five attributes— "Sensory stimulation", "Familiarity", "Sense of ownership", "Social interaction" and "Accessible space and built features"— were assigned a relatively higher number. From

the administrator's perspective, the organizational environments may have shaped the courtyard as an accessible place with emphasis on sensory and cognitive stimulation as well as a sense of belonging.

The researcher's evaluation is slightly different from that. Observed organizational efforts were focusing on sensory stimulation, accessibility and maintenance of safety but overlooked experience of "Familiarity", "Sense of ownership" and "Participation in meaningful activity"; the neglect may be caused by over-emphasis on censorship of resident's action and a lack of knowledge in using natural resource to create more individualized activity programs.

The attribute "Awareness and orientation" scored the lowest in both raters' judgment. There are two potential reasons; first, information regarding the courtyard activities is not listed in activity calendars. Since the courtyard is not so visible from corridors, residents are less likely to receive immediate outdoor activity information while traveling between spaces. Second, outdoor rules are ambiguous; few attempts were made to clarify or guide outdoor behavior. Administrator's permission or rejection defines behavioral appropriateness of the courtyard.

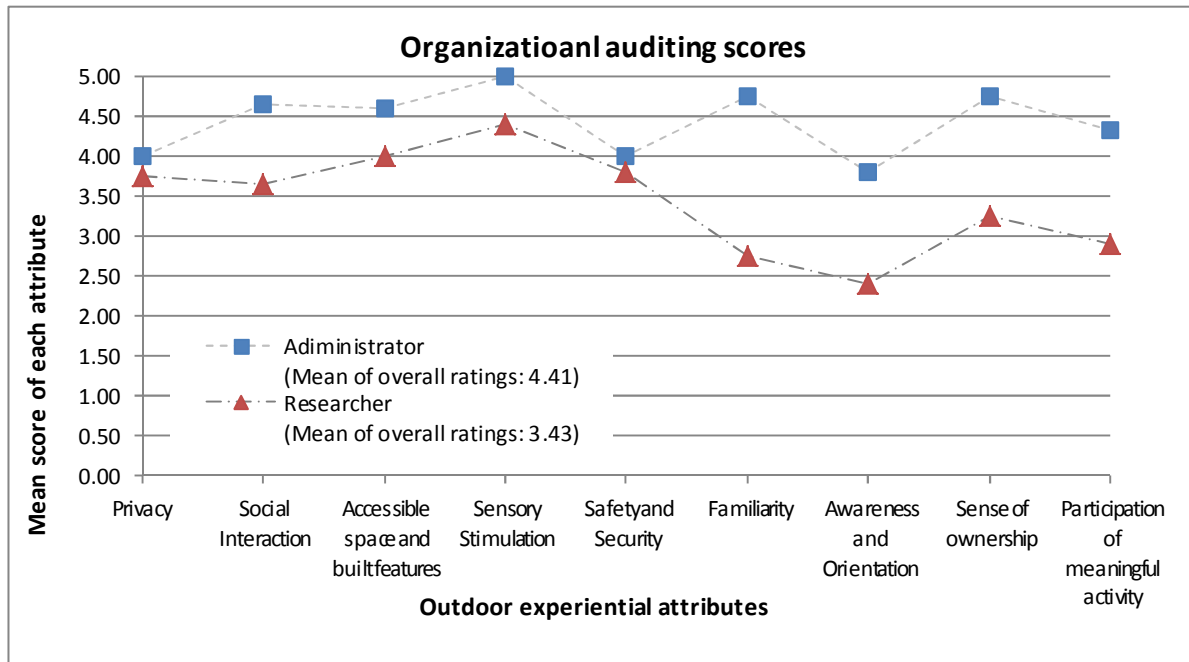


Figure 6-5. Auditing scores of organizational aspects of the courtyard at Elderly Living

B. Staff-resident relations in outdoor programs

1. Staff in the facility: variety and training

The activity director was unable to complete the survey regarding staff information. The following description is the summary of findings from the facility's brochure, webpage and Wisconsin Department of Health Service.

The facility has physicians, occupational/physical therapists, social workers, mental health services personnel, recreational therapists (one activity director, two regular staff and two activity assistants) and religious counselors. About 64 percent of full-time registered nurses and 59 percent of full-time nurse aides have worked in the facility for more than 12 months. Some volunteers would bring

residents outside and lead a one-on-one activity such as strolling along the courtyard. Due to inadequate information, scores of the RSIF on staff resource are unavailable.

2. Resident influence and staff responsibility

Elderly Living has a top-down decision-making process related to the courtyard; except activity programs, the administrator is involved in all different aspects of it. She is the main caregiver of the courtyard, taking strong ownership of it.

1) Gardeners of the courtyard

Planning, planting & maintaining

The courtyard was constructed 20 years ago when the corporate added an addition. The figure-8 shows that shaped path and 13 crabapple trees were placed at that time. The current administrator and activity director came in to the office after the construction.

Garden space in the courtyard is planned by the administrator every spring. She and the activity director (or marketing director) purchase flowers. When selecting flowers, they take sun/shade tolerance as well as price into account. Residents' preference of flowers is not fully considered. The activity director mentioned, "I don't remember residents talked about their preference of flowers in resident councils. Maybe they did but I don't remember." Some inquiries may be made before the purchase; the administrator said, "We did talk to them at the beginning of the season about what they like and whether anybody wants to involve in that. We give them opportunities but we don't force them to have a job doing something out there." However, neither the administrator nor director explained how residents' preference is translated into flower selection, how many people are consulted with and what strategies are used to encourage their decision-making.

A planting day is usually scheduled after garden materials are ready. On that day, the administrator, staff, volunteer and few residents put the plants in the raised bed and flower boxes. The administrator stated, "My job is to make sure we do the seasonal planting and make sure it looks good."

The director comments, "She (the administrator) decides what kinds of flowers are added in the courtyard. She usually plans that because she likes to do that. She is the first administrator I have seen taking interests in garden space." The director furthers comments, "In the spring, we have a gardening activity, and prepare for it. After that, we just maintain it for the rest of time during the summer." Maintaining garden space is a team work with assigned responsibility. Maintenance staff makes sure that everything is watered; the administrator herself waters the plants too. A weekend manager will take care of that during weekends.

Roles of residents perceived by the administrator and director are more passive in gardening. The administrator put it, "Most of the residents watch the gardening but some of them work out there a little bit. They pick up dead heads of flowers or weeds, and make sure they are being watered." The director had a similar perspective; she found majority of residents would enjoy the courtyard visually. They are more like supervisors; she stated, "They can't really get out of their wheelchairs and do planting but they do a lot of supervision. They will tell you what to do; they let you know which plants work better in the sun or shade, and which plants need to be watered...they will pass information to staff."

After the planting day, gardening becomes no more than a topic in activities of reminiscence or "creative expression". The director put it, "Gardening is a good reminiscent topic because you have residents who have history of it. They have done through their life so they talk about it...In this outdoor setting, you will soon find that somebody starts talking about their gardens and flowers. We just go eight African violets donated, and people who know anything about the plants will tell you why violets don't like to be relocated a lot? I didn't know this because I am not a green thumb...Those are things they know and talk about. They share. It is a great time for them to share their knowledge and things they used to do." Unfortunately, residents' vernacular knowledge of gardening is not applied to planning,

planting or maintaining. Garden space in the courtyard reflects administrator's garden rules rather than residents'.

Funding:

Funding of this courtyard is stable; it is part of a ground-and-maintenance budget every year. "It is a small space so we can handle it pretty well financially," the administrator said. The activity director was never asked to do fundraising.

Changing of the courtyard

Temporary changes such as furniture arrangement require no staff permission. However, adding a birdhouse, birdfeeder or flower basket requires the administrator's approval.

No one tried to feed birds with leftover bread during the observation period. In the courtyard, there are staff-and resident-made form-cup birdfeeders. However, the rain wore them out. The only durable and robust birdfeeder was brought by a resident who loves bird watching. He wrote a letter to the administrator and negotiated with her about location, maintenance and orientation of it. She eventually let him place the birdfeeder and asked him to take responsibility for it. "I decided to give it a try and see if that works or not." The negotiation continued during the observation period. The resident said that the administrator does not like it, and he found the birdfeeder was turned to face the walkways. He turned it back so he can see birds eating from the central patio.

Planting vegetables, flowers and herbs other than what are purchased by the facility needs an approval, too. Family members and kitchen staff proposed to add some vegetables and herbs; the administrator quickly approved the idea. The materials were used in cooking for meals; residents are not encouraged to pick up tomatoes and taste them right away. The vegetable and herb garden was not continued because no one carried on the work to take care of them.

Outdoor decoration was placed by activity staff. No art work made by residents is displayed. Furniture is provided by the facility; no chair is brought by residents or family members. There is no

trace of permanent changes initiated by residents or family members. For example, no engraving plates or plaques in memory of somebody are found.

Inappropriate furniture, appliance, and decoration perceived by the administrator will be removed by maintenance staff. One day, the administrator found a small and portable grill was placed under a tree. She immediately asked maintenance staff to remove it and asked family members to claim and identify that. The reason to remove it, according to her, is to reduce a misunderstanding that the grill is available and can be used.

The activity director never proposed a change to the courtyard, although she and activity staff both agreed that it is important to even the ground and widen the walkway. However, the discussion stopped when a financial issue was brought up. The director said, "That is something on a corporate-level...It requires a proposal" and she did not proceed to make a proposal. According to the activity staff, a short of funds is one reason delaying her proposal of improving the courtyard. "I think they agree my ideas but it is away a funding issue. That is related to several questions like "Who pays for that?" "Where the money comes from?" "Will it take away some activity fund?" I think it is not easy to make a change" The activity staff did ask maintenance staff to find a solution to even the indoor-outdoor floors. She was told that the change is expensive, but an attempt will be made to allow smooth transportation and reduce needs of lifting wheelchairs.

2) Ownership of the courtyard

The administrator, activity director and staff have a similar perception of ownership of the courtyard. The administrator puts it, "I will say myself and maintenance staff as far as making sure everything is safe and usable. We take responsibility for it." From her perspective, residents can take ownership too. "They just ask what they want (e.g., a birdfeeder) and we make decision of whether it works. If we ask residents, and they express interest, we just go with flow; if it is going to work, it is fine with us." In such decision process, residents' ownership is indirect and restrictive.

The director felt that the facility takes major responsibilities and ownership of the courtyard, and most of the residents enjoy what has been prepared for them. The activity staff further comments, "I think courtyard is just something provided for residents. I don't think "ownership" is a good word to describe that. However, we as staff have a sense of ownership because we all have equal opportunities to do things in the courtyard."

3. Support of the experiential attributes

An attempt to collect the activity staff's evaluation scores failed. It is unable to know how the staff perceived their practice and interactions with residents. Although phone and email reminders were sent, the result was not received. Figure 6-6 shows evaluation made by the researcher. Three attributes: "Social interaction", "Privacy" and "Safety and security" scored relatively higher, suggesting that staff practice emphasizes safe and private social activities. The result may also indicate that staff are given an adequate organizational support in terms of resources for structured and spontaneous group activities. Four attributes: "Participation in meaningful activity", "Sense of ownership", "Sensory stimulation" and "Accessible space and built features" were assigned a lower score. Insufficient knowledge and passive attitude toward resident active engagement may be blamed for the low achievement.

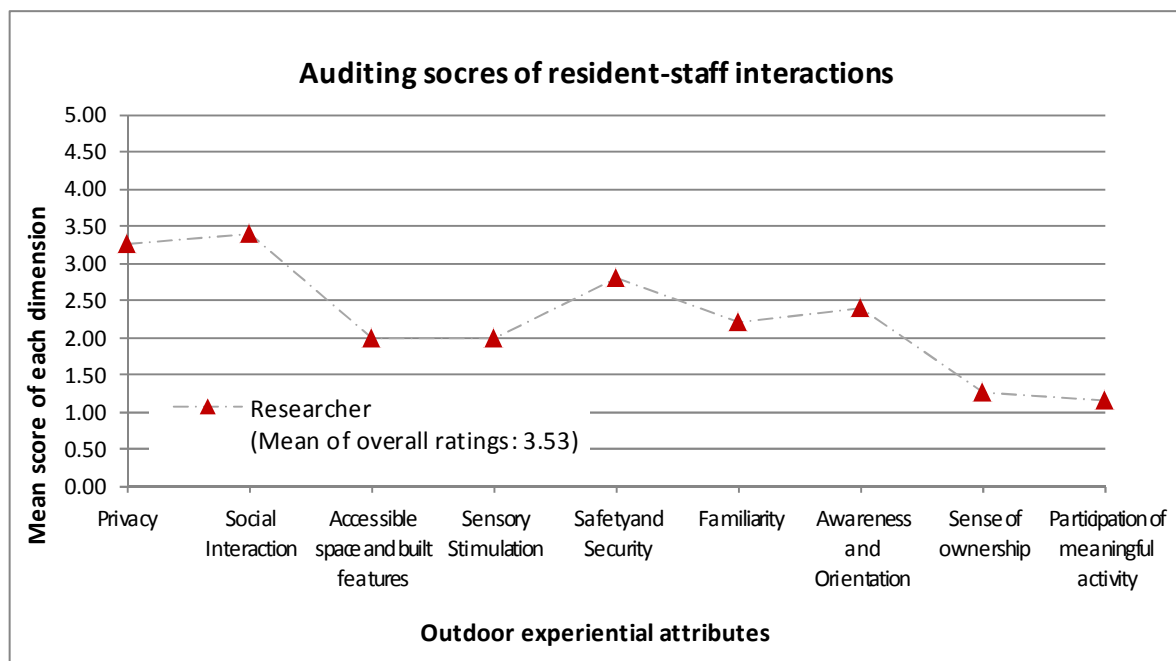


Figure 6-6. Auditing scores of resident-staff relations in the courtyard at Elderly Living

C. Resident profile

The activity director did not complete the survey of resident background and characteristics.

Most of the following discussion is based on interviews with staff and data from the Centers for Medicare & Medicaid Service.

1. Demography and background

Elderly Living housed 124 residents in 2013. Thirty-five percent of residents paid all or a portion of their fees with Medicare, and sixty-five percent of residents with Medicaid. Approximately 50 percent of the residents are either unskilled laborer or blue-collar workers; around 25 percent are homemakers or housewives and 25 percent are professional or executive. Near three-quarters of the residents aged 75 and older. The average age of the residents is 80. The residents are heterogeneous in ethnicity. Approximately 60 percent are Caucasians, 20 percent are African Americans and the rest of them are Hispanic or other. Three-quarters of the resident are Catholic and the rest of them are Protestant. Ten percent of the residents were not born in the United States, and five percent do not speak English well enough to make themselves easily understood. Sixty-five percent have been living in the facility for more than 12 months.

According to the activity director, about 50 percent of the residents have history or interests in gardening, and three-quarters like to sit in the courtyard. She stated, "A lot of our residents are people who live in this area (City of South Milwaukee) or Racine. A lot of them are blue -collar workers or come from a middle-class family. Among the age group we have now, a lot of women were stay-at-home moms, house workers or house wives. They had time for gardening in the past... Lots of men who are at age of 80s or 90s did help make gardens or grew vegetables before."

2. Activities of Daily Living

According to the activity director, approximately 25 percent of the residents are able to carry out daily activities without help. Nearly 50 percent need assistance from staff. The rest of them are

completely dependent in grooming, eating, dressing, walking, transferring, bathing and getting to the bathroom on time. According to data from the Centers for Medicare & Medicaid Service in 2013, about half of the residents have issues of losing control of their bowel or bladder. A bathroom near the courtyard may help outdoor users reduce fear of incontinence. Unfortunately, the closest bathroom from the courtyard is for visitors; it requires a key from the receptionist. Residents who want to use a toilet are brought back to their room rather than a nearby washroom. Neither the physical environment nor a care protocol helps reduce incontinence worries.

3. Resident experience of home garden and gardening

Only seven interviewees (one male and six females) were recommended by the activity director to participate in the interviews. The average age of the group is 78.7 years ranging from 48 to 101. Their occupational background is diverse, including semiprofessional, clerical worker, housekeeper and factory worker. All of them are on wheelchair. Six of them may not know what day and year it is. All of the interviewees but one join the activities more than three times a week.

Themes discovered from Elderly Living are similar to that in other two facilities. Ten major themes were identified, including 1) garden rules, 2) a shared & compromised garden, 3) food bank, 4) sensory experience, 5) a nature lab, 6) competing with nature, 7) work ethic, 8) hard work, 9) feedback, and 10) my home (Table 6-10). A complete list is provided in Appendix M.

Sensory stimulation” and “my home” were the most frequently discussed topics, followed by “garden rules” and “hard work”. Themes related to “a nature lab” and “work ethic” were less prominent. Similar to the groups in other two facilities, the interviewees of Elderly Living liked to describe their home garden experience in terms of food-related subthemes like “cooking from gardens” and “food bank”. Practice of home gardening related to “dwelling and resting” and “starting from scratch” triggered reminiscence too.

One unique feature of this group is that they emphasized the routine or sequence at home in the sub-theme of “home gardens as a part of life”. For example, working with dirt reminds Aggie (EL1³⁴) of helping her dad in coal mine when she was young; her life in that particular period was anchored between home and the mine. Jenna (EL3) felt she had responsibility of taking care of her mother’s victory garden when her dad left home for World War II; she used to pick up and cook vegetables from the garden every day. Levi’s (EL4) husband worked in the Green Giant factory; she still remembered that trains would pass by her garden to transport goods to the factory. These routines imply contiguity of traveling between home (or gardens) and a particular place. “Home” was experienced as sequences of things, tasks and places or from Kaplan’s perspective, as a cognitive map in which one’s home is placed at the center with linkage of other meaningful landmarks.

Table 6-10. Major themes and their frequency emerging from resident interviews in Elderly Living

Major themes	Sub themes (# of frequencies)	Example narratives
Gardens Rules (28)	Following rhythms of seasons (8)	<ul style="list-style-type: none"> • In October, I cleaned up the garden. In the spring, I did that again and flipped over soils.
	Principles of better gardening (10)	<ul style="list-style-type: none"> • Chives just need some sunshine.
	Family teamwork (10)	<ul style="list-style-type: none"> • My husband helped me get rids of weeds. We took turn to mow lawns.
A shared & compromised garden (11)	Family first (4)	<ul style="list-style-type: none"> • I pickled most of the beets. My family like them pickled.
	Sharing food & information (6)	<ul style="list-style-type: none"> • We used to share vegetables with neighbors. We exchanged food.
	A compromised place (1)	<ul style="list-style-type: none"> • There was never enough time. I used to spend at least an hour a day and several days a week. I would garden in the morning or evening depending on children’s schedule.
Food bank (14)	Food bank (14)	<ul style="list-style-type: none"> • I had beans not peas although I remember picking up peas out of my mother’s victory garden.
Sensory experience (50)	Beautifying the house (10)	<ul style="list-style-type: none"> • I made flower bouquets sometimes in our big house. We had several lilac bushes. We had white and purple. They were so beautiful in the house. They smell so good.
	Interactions with pets or wild	<ul style="list-style-type: none"> • I don’t remember we had a lot of birds; I guess because

³⁴ “EL1” means #1 interviewee of Elderly Living (a complete list of the interviewees, see Appendix P)

	animals (8)	we had cats. We had a couple of cats. They played outside. They played both inside and outside.
	Cooking from the garden (32)	<ul style="list-style-type: none"> • My mom would can tomatoes. We would cut the tomatoes and put in a freezer so we can use in winter time. You can make soup too.
A nature lab (5)	Gardening as trial and error (3)	<ul style="list-style-type: none"> • You learn things by trying things.
	Unpredictable gardens (2)	<ul style="list-style-type: none"> • Sometimes something did not materialize as we expect.
Competing with nature (14)	Battling with the uninvited (10)	<ul style="list-style-type: none"> • I dug weeds. They had a lot of seeds. My neighbor cut the grass but he didn't cut the root so we got a lot of dandelion seeds from him. We never used sprays. We had a lot of crabgrass in our garden.
	Weather factors (4)	<ul style="list-style-type: none"> • I would be worried about my garden if the weather was too hot. I kept watering to save plants.
Hard work (20)	Physical demands (6)	<ul style="list-style-type: none"> • I had a back surgery and I couldn't bend down but I would sit down. I would sit down and pull weeds.
	Starting from scratch (14)	<ul style="list-style-type: none"> • We used to start many things from the seeds. Even the tomatoes, we started from the seeds...We had a lot of peppers. When they turned red, we took out their seeds. When you take out tomatoes seeds, let them sit couple of days and put them to dry.
Busy ethic (11)	Never-ending tasks (11)	<ul style="list-style-type: none"> • I like to keep myself busy in all different types of things.
Feedback (19)	Self-value & satisfaction (14)	<ul style="list-style-type: none"> • You felt good that you had your own garden and you could save some money.
	Relaxation and being away (5)	<ul style="list-style-type: none"> • My garden was very quiet. I could have my own time.
My home (43)	Family tradition (8)	<ul style="list-style-type: none"> • I knew gardening because of my mother. I learned by watching her doing gardens.
	Dwelling and resting (19)	<ul style="list-style-type: none"> • We had a big grass. We didn't have money to put furniture outside. We used to put a blanket. We had a porch but it was not big enough to enjoy things.
	Playground (1)	<ul style="list-style-type: none"> • My dad used to grow a lot of cucumbers for pickles. He put cucumbers in whisky bottles, and they grew and grew. He would broke up the bottle and have bottle-shaped cucumbers.
	Gardens as a part of life (7)	<ul style="list-style-type: none"> • My husband worked in a factory called Green Giant. We had a small garden. Our home was on the hill. We had a lake in front of the house. We had a train passing by because of this factory. Later, we opened a shop.
	Home at present/self at present (8)	<ul style="list-style-type: none"> • I miss my wife and also my garden. They are a part of my life.

IV. Comparison of people components between the cases

A. Organizational context

Comparison of organizational contexts is provided in Table 6-11. Each nursing home is characterized by different amount and types of organizational resources and culture, which shapes its courtyard space into different place experience.

Table 6-11. Comparison of organizational characteristics between the cases

	Silver Life	Golden Age	Elderly Living
Organizational structure	Flat & Professional	Flat & Entrepreneurial	Hierarchical & Professional
Facility-level information: overall policy and care program (POLIF, Moos & Lemke, 1994)			
Expectations for functioning	0%	0%	0%
Acceptance of problem behavior	18.75%	62.5%	31.25%
Policy choice	72.22%	77.78%	68.42%
Resident control	42.28%	38%	58.62%
Policy clarity	80%	62.5%	87.5%
Provision of privacy	50%	30%	50%
Availability of health services	88%	75%	87.5%
Availability of daily living assistance	100%	100%	92.86%
Organizational aspects of the courtyard			
Philosophy	A good addition to quality of life and a part of marketing plan	A low-cost but appearing outdoor space	A nearby and calm outdoor space, adding little staff workload of transportation
Outdoor activity program	<ul style="list-style-type: none"> • Staff decision with resident input • Calendared activity • Passive, familiar and social-based • Once-a-while gardening or other active activities 	<ul style="list-style-type: none"> • Staff decision with administrator's input • Calendared activity • Passive & physical-activity oriented • Once-a-while gardening 	<ul style="list-style-type: none"> • Staff decision with resident input • Non-calendared activity • Passive, social-based • No gardening or other active activities
Outdoor policy	<ul style="list-style-type: none"> • Group decision-making • Clear dos and don'ts • Encouraging spontaneous social & familiar activities • Administrator's approval of 	<ul style="list-style-type: none"> • administrator-decided or pre-existing • Ambiguous rules (one can do something until staff stops it) 	<ul style="list-style-type: none"> • administrator- & group decision making • Encouraging spontaneous social activities

<u>permanent changes of</u> environments		• Administrator’s approval of <u>any change of</u> environments	
Supportiveness to the nine attributes			
Attributes score at the <u>top three</u> in the research’s judgement	<ul style="list-style-type: none">• Social Interaction• Information awareness and spatial orientation• Familiarity	<ul style="list-style-type: none">• Familiarity• Information awareness and spatial orientation• Participation in meaningful activities	<ul style="list-style-type: none">• Social Interaction• Privacy• Safety and security
Attributes score at the <u>bottom three</u> in the research’s judgement	<ul style="list-style-type: none">• Sense of ownership• Participation in meaningful activities• Sensory stimulation	<ul style="list-style-type: none">• Social Interaction• Sensory stimulation• Privacy	<ul style="list-style-type: none">• Sense of ownership• Sensory stimulation• Familiarity• Participation in meaningful activities

Organizational structure and facility-level information

All of the three cases are licensed and certified Wisconsin nursing homes, characterized by for-profit ownership. Their organizational structures are close to what Mintzberg called "Professional Bureaucracy" (Mintzberg, 1979); it "relies for coordination on the standardization of skills and its associated design parameter, training and indoctrination. It hires duly trained and indoctrinated specialists— professionals— for the operating core, and then gives them considerable control over their own work." (p. 349) Organizations of universities and hospital belong to this category (Mintzberg, 1979).

However, factors like scale of the organization, organizational philosophy, leadership style and other factors make their organizational structure slightly different from one another. Silver Life and Golden Age have a relatively flat structure except for their nursing departments. It was easy to find that the administrator had opportunities of interacting with activity staff and understand their ideas of work. On the contrary, department-directors report to the administrator in Silver Life while the administrator in Golden Age tends to supervise front line staff and increases her influence over their work. The organization to some extent runs in a simple or entrepreneurial structure (Mintzberg, 1979), in which "coordination...is effected largely by direct supervision. Specifically, power over all important decision tends to be centralized in the hands of the chief executive officer." (p. 306) One possible reason to

legitimize the administrator's wide span of control is that her staff skill, operation and coordination may not be well developed; to maintain efficiency and better performance, everything has to be controlled under direct supervision. Communication occurs informally between the administrator and everyone else.

Elderly Living, by and large, has complicated and hierarchical structures; it is characterized by clear skill division and independent/autonomous work. Managerial meetings are emphasized. Very few interactions were found between the administrator and front-line activity staff.

The scores of Policy and Program Information Form (Moos & Lemke, 1994) also help differentiate the three nursing homes. As shown in Table 6-11, Silver Life expects a lower effort in behavioral management and gives less resident autonomy and policy choice; the facility would rather put more focuses on quality of health services and assistance. On the contrary, Golden Age has higher tolerance of problematic behavior and more policy choices but less availability in health services. Elderly Living puts more thoughts in resident control and policy communication but give fewer policy choices and assistance of daily living; in other words, residents are given limited authorities.

Organizational aspects of the courtyard

1) Philosophy

Philosophy of providing courtyard space is quite different between the cases. In Silver Life, its courtyard is not necessarily a feature but an addition to quality of life; it has a marketing value that helps distinguish the facility from competitors. Golden Age has a philosophy that addresses a low-cost and attractive outdoor space; any activity or improvement should be a low-cost or free plan. An ideal courtyard to Elderly Living is a nearby and calm outdoor space, which adds little staff workload in transporting residents.

2) Outdoor activity programs

Following the philosophy, each of the facilities has unique features in its outdoor activity program. Silver Life's outdoor program provides diverse social and familiar activities; it aims to enrich life experience by arranging different scales and contents of social events. The program is decided by activity staff with resident input; residents have a voice in resident councils or give feedback of activities in private. Courtyard activities are listed in activity calendars, allowing residents to anticipate future events. Gardening and other active interactions with the courtyard (e.g., decorating the courtyard) are arranged once in a while.

Golden Age, on the other hand, is on the different end of a spectrum. Given limited budget, most of its outdoor activities include a small and repetitious social or exercise group; a large social party with food and decoration is not likely to be arranged. The courtyard is viewed as extension of indoor activity space; once the weather is not permitting, staff can easily move outdoor activity inside. Monthly activity schedule is decided by the activity director with the administrator's input related to safety and security. Outdoor activities are listed in calendars to help increase awareness of activity information. A planting day is usually scheduled in May. After that day, gardening is a spontaneous.

Outdoor activities are not addressed too much in Elderly Living. Spontaneous social activities are encouraged and preferred. The activity program is planned by the activity department with resident input; no specific outdoor activity is listed in calendars, although staff would eventually arrange some outdoor programs like a music concert or a small-group happy hour. Most of the activities are compatible with indoor and outdoor settings; having a courtyard activity is staff's decision; it depends on staff efforts to overcome challenges (e.g., transportation) and to make that happen. A planting day is usually scheduled in May but residents are more likely to watch staff gardening instead of participating. After that day, no structured gardening is planned. Self-initiative gardening is not encouraged.

3) Outdoor policy

Outdoor policy in Silver Life is to facilitate social interactions, familiar activities and maintenance. It is co-decided and reviewed in staff meeting and constantly updated to meet residents' needs and communicated with residents in several ways. Their policy related to availability, safety and outdoor eating specify staff responsibility of information communication and activity delivery in creating social settings. Feeding animals is prohibited to maintain neat and clean environments. Slight or temporary changes to the environments such as adding a birdfeeder or placing flower basket is allowed without permission, but permanent changes such as adding a memorial plate, decoration or a garden space require the administrator's approval.

Overall, rules of the courtyard in Golden Age are flexible in a way that residents can do things until the administrator stops them due to safety concerns. If the administrator sees something inappropriate, she will give immediate instruction on what should or should not be done. Policies related to safety and security in particular are decided by the administrator. Others are pre-existing rules (e.g., availability of the courtyard), which have not been reviewed for more than 10 years, and staff are used to them. One potential problem is that it is unclear to know whether some of the old rules are well communicated with residents and all staff members. It has been found that the administrator, activity director and residents have different interpretation of availability of the courtyard.

Elderly Living's outdoor policy contains features of the above two cases. Policy in general encourages spontaneous social activities. Rules regarding availability, safety, and maintenance are discussed in staff meeting. Others are decided by the administrator; for example, gardening activities (e.g., watering and weeding) or any changes of environments require her approval. A picnic is allowed but a lunch meal delivered to the courtyard is not available.

Support of the experiential attributes

The researcher's evaluation regarding are illustrated in Figure 6-7. In general, Silver Life has a higher score than the other two (mean=3.80), and Golden Age lies at the bottom (mean=2.44). Silver Life's policy, program and resource focus on three attributes: "Social interaction", "Awareness & orientation" and "Familiarity". Golden Age is an opposite example, which is characterized by below-average organizational efforts in most of the attributes. However, lacking of attention and restriction from staff has helped more spontaneous and familiar activities for the residents. In Elderly Living, organizational resources are placed into "Sensory stimulation" and "Accessible space and built features"; clear responsibility of maintaining the courtyard and consideration of wheelchair users make natural resources accessible and stable.

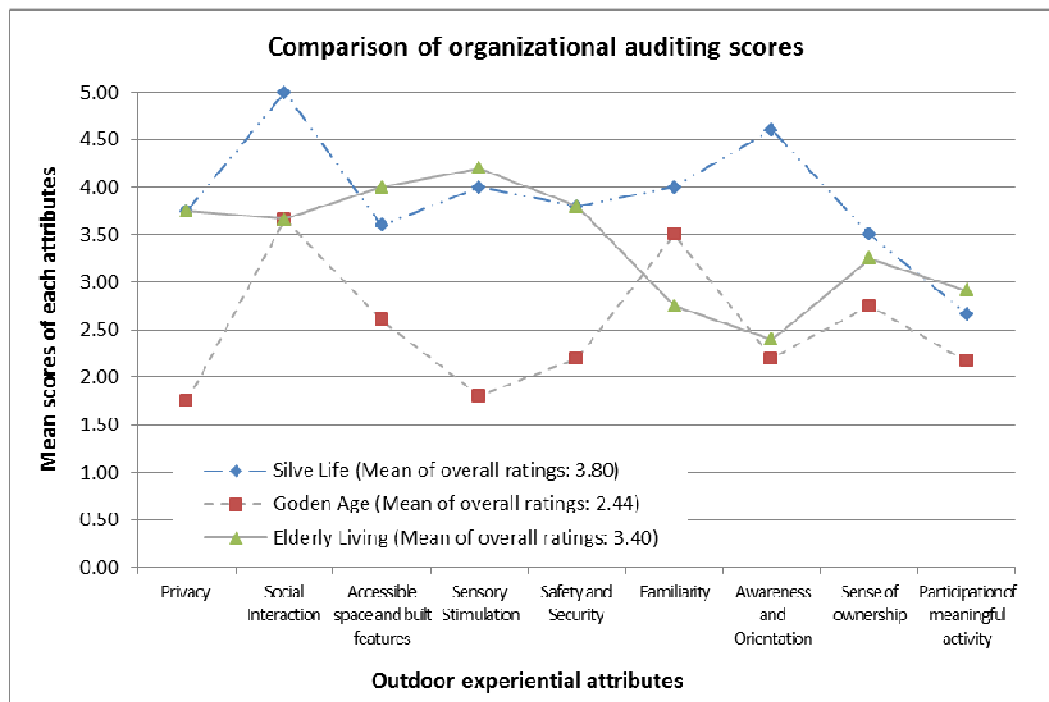


Figure 6-7. Comparison of organizational auditing scores between the cases

Both Silver Life and Elderly are characterized by a top-down decision-making process; their courtyards give more emphases on "Social interaction" but overlook "Sense of ownership" and

“participation in meaningful activity”. The priority suggests that the two facilities encourage a passive and less autonomous role of residents in interaction with the courtyards. Residents may have few opportunities to express and negotiate for what an ideal courtyard ought to be.

B. Staff-resident interactions

Comparison of staff-resident interactions is provided in Table 6-12. In general, Silver life and Elderly living have more staff resources based on the analysis of the RSIF scores, nurse-resident ratio and the number of activity staff. A similar activity staff-resident ratio is found across the three courtyards; there are usually two activity staff transporting residents and one staff leads a 10-person group.

Table 6-12. Comparison of staff-resident interactions between the cases

	Silver Life	Golden Age	Elderly Living
Staff resource (the RSIF score, Moos & Lemke,1994)	92.3%	69.2%	n/a
Nurse–resident ratio / Aide–resident ratio	1:11/1:9	1:20/1:81	1:9/1:8
# of activity staff or recreational therapists	6 (4 regular staff) One activity director Three major activity staff Two activity assistants	3 (2 regular staff) One activity director One major activity staff One activity assistant	5 (three regular staff) One activity director Two major activity staff Two activity assistants
Staff-resident ratio in a courtyard activity	≈1:10-15 (two to three staff transport residents and one leads activities)	≈1:10 (two staff transport residents and one leads activities)	≈1:10-15 (two staff transport residents and one leads activities)
Gardener of the courtyard			
Planning	Administrator	Activity director & residents	Administrator and activity or marketing director
Funding	Administrator	Activity director	Administrator
Planting	Activity staff, family volunteer & residents	Activity director & volunteers	Administrator, staff & residents
Maintaining	Maintenance staff, contracted workers, activity staff, family volunteer & residents	Activity director, maintenance staff & residents	Administrator & maintenance staff
Permanent change the courtyard	Administrator,	Administrator & activity	Administrator,

or making a proposal of change	maintenance staff, activity director, family members & residents	director	maintenance staff & activity staff, family members & residents
Ownership of the courtyard			
From the administrator's perspective	Multiple-ownership	Residents	Administrator & maintenance staff (limited resident's ownership)
From the activity director's perspective	The administrator and residents	Activity department	The facility & activity staff
From the activity staff's perspective	The residents have little ownership	n/a	Activity staff
Supportiveness to the nine attributes			
Attributes score at the <u>top three</u> in the research's judgement	<ul style="list-style-type: none"> • Social Interaction • Information awareness and spatial orientation • Privacy 	<ul style="list-style-type: none"> • Sensory stimulation • Safety & security • Familiarity 	<ul style="list-style-type: none"> • Social Interaction • Privacy • Safety & security
Attributes score at the <u>bottom three</u> in the research's judgement	<ul style="list-style-type: none"> • Participation in meaningful activities • Sensory stimulation • Safety & security 	<ul style="list-style-type: none"> • Accessible space and built feature • Participation in meaningful activities • Sense of ownership • Privacy 	<ul style="list-style-type: none"> • Participation in meaningful activities • Sense of ownership • Accessible space and built feature

Resident influence and staff responsibility

1) Gardener of the courtyard

One common feature among the three courtyards is that their administrator and staff are major caregivers of the gardens; residents take whatever staff prepare for them. In Silver Life, the administrator is a major decision maker and staff are major participants of courtyard-related activities from planning, planting, maintaining to improving (changing) the courtyard. Resident's active interactions with the courtyard are limited to a once-a-year planting activity, light gardening like deadheading or small decoration such as adding a birdfeeder or flower basket. Permanent changes to the courtyard have to be administrator-approved; changes had been initiated by different roles including the administrator, maintenance staff, activity director and family members.

At Golden Age, the activity director is a major decision-maker and gardener; she takes care of almost everything related to the courtyard. Residents are able to participate in one-day spring planting and light gardening (weeding & watering). Both the administrator and activity director had proposed changes to the courtyard; however, only the changes initiated by the administrator were executed.

The administrator of Elderly Living takes more control for the courtyard than the other two. She charges of spring planning, flower purchase, funding, planting and maintaining (watering). She is also a censor examining and approving proposals of any change of the courtyard including adding a birdfeeder or removing a grill. Activity staff and residents don't have much role in decision-making. Residents may participate in a once-a-year planting activity. Changes of the courtyard have been initiated by the administrator, a resident, family member and kitchen staff. The current activity director and staff never take action to improve the courtyard although they all think some changes are necessary.

2) Ownership of the courtyard

There is a divergence of views on who owns the courtyard. In Silver Life, the administrator's "multiple-ownership" concept (decision related to the courtyard is not made by a single person) is not quite perceived by staff; the activity director and staff felt that they are striving for more resident ownership. In Golden Age, ownership of the courtyard is perceived completely different between the administrator and director. The administrator thinks that residents own the courtyard although that idea does not reflect in her top-down leadership. The director felt she had a complete ownership of the courtyard before new corporate bought the facility; she is willing to reclaim it and take full responsibility of the courtyard. In Elderly Living, the administrator takes full ownership of the courtyard. Residents' ownership is conditioned; as described by the administrator, residents may take ownership too when it is allowed.

Support of the experiential attributes

Overall results of the researcher's evaluation are illustrated in Fig VI-8. Silver Life outperforms the other nursing homes (mean=3.53), and Elderly Living scores at the bottom (mean=2.22). In Silver Life, staff's training and practice support "Social interaction", "Awareness and orientation as well as "Privacy" in particular. On the contrary, Elderly Living in general has a below-average rating; staff have a more conservative attitude toward resident outdoor independence (doing things on their own and trying new things), which affects scores of "Sensory stimulation", "Familiarity", "Sense of ownership" and "Participation in meaningful activities". Staff of Golden Age take resident's preference into account when making flower and vegetable selection. They also allow residents to do some light gardening, save bread to feed birds and smoke. Their practice facilitates engagement of multiple-sensory stimulation and familiar activities. Their attitude toward an active garden is more positive even though the budget is limited.

Overall, staff-resident interactions in the three courtyards neglects "Participation in meaningful activity", "Sense of ownership", and "Accessible space and built features". Inadequate knowledge on application of natural material and accessories may make outdoor activities less interesting, accessible and meaningful.

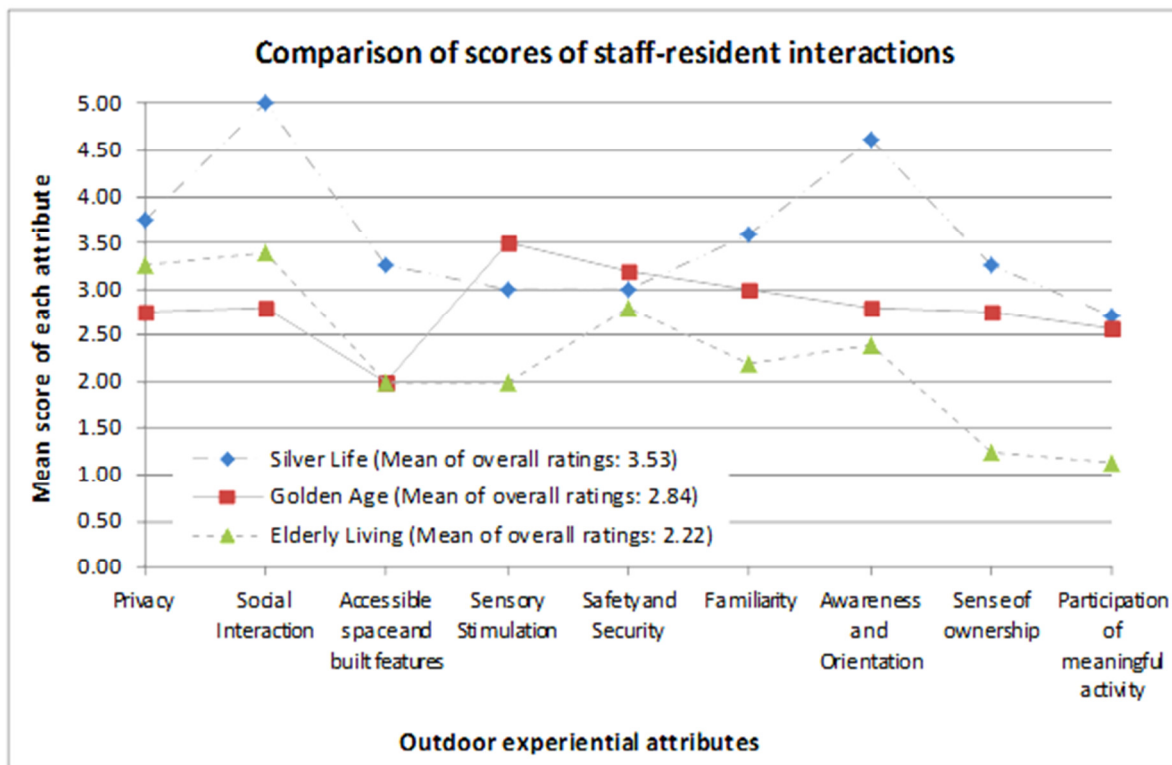


Figure 6-8. Comparison of auditing scores of staff-resident relations between the cases

C. Resident profile

1. Demography and functioning levels

Comparison of resident's background information is provided in Table 6-13. Demographically, Silver Life's residents are much older than those at the other two nursing homes. They have a higher educational level, and a more homogeneous ethnic background; approximately 99 percent of the residents are Whites.

In terms of activity of daily living, Golden Age has a higher percentage of residents who are completely dependent; the majority of them need staff's full attention on grooming, walking, transportation, bathing and using a bathroom. Besides, it seems that higher percentage of residents at

Golden Age suffer from cognitive impairment³⁵ although its average age is much younger. One common issue among the three resident groups is incontinence. To accommodate their need, a bathroom near the courtyard space and on-site staff are very important. However, the need is not fulfilled in any of the three cases.

2. Experience of home garden and gardening

Another sharing feature is that most of the residents have interests or experience of gardening (Table 6-13). To understand their home garden experience, a total of 42 residents from the three facilities were recruited to participate in the interviews. Table 6-13 listed all sub-themes and frequencies derived from the 43 interviews.

Home garden/gardening experience is mostly connected with topics of sensory experience, practice of gardening as well as home-making. “Cooking from the garden” is the most frequently discussed theme, followed by “food bank”, “battling with the uninvited”, “principles of better gardening” and “dwelling and resting”. Topics like “a compliant place”, “playground”, “learning new things” and “doing everything yourself” were barely mentioned.

³⁵ Information regarding resident’s cognitive ability in Elderly Living is incomplete.

Table 6-13. Comparison of resident profile between the cases

	Silver Life	Golden Age	Elderly Living
# of residents	96	51	124
Male-female ratio	1:4	1.2:1	n/a
Age			
<64	0	16%	25%
65-74	3%	33%	
75-84	23%	31%	75%
85 and over	74%	17%	
Education			
Less than high school	20%	5.9%	n/a
High school	20%	84.3%	
College and over	60%	9.8%	
Ethnic group			
White	99%	51%	60%
Black	1%	45%	20%
Other	0	4%	20%
Activity of daily living (% of residents who are complete dependence)			
Grooming	10%	29%	25%
Eating	2%	15%	25%
Dressing	2%	25%	25%
Walking	10%	67%	25%
Getting in and out of bed	5%	37%	25%
Bathing	2%	100%	25%
Toilet	70%	82%	25%
Communication	5%	8%	25%
Handling money	83%	100%	25%
Cognitive ability			
Moderate dementia	25%	19.6%	n/a
Severe dementia	20-25%	66.7%	n/a
History or interest of gardening	90-95%	90-95%	50%

3. Linkage of the nine experience attributes

The 27 sub-themes (Table 6-14) are analyzed using Model of Experiential Outdoor Environments of Nursing Homes (Figure 3-15). Based on their involvement with action, preference and knowledge, they are linked with the nine outdoor experiential attributes.

Table 6-14. Results of content analysis derived from the 43 interviews

Sub-theme	frequency	Sub-theme	frequency
1. Following rhythms of seasons	31	15. Never-ending tasks	25
2. <i>Principles of better gardening</i>	58	16. Doing everything yourself	4
3. Family teamwork	51	17. Physical demands	27
4. Family first	26	18. Starting from scratch	56
5. Sharing food & information	38	19. Learning new things (#24)	6
6. A compliant place	5	20. Self-value & satisfaction	50
7. <i>Food bank</i>	74	21. Physical health (#23)	8
8. Beautifying the house	51	22. Relaxation	14
9. Interactions with pets or wild animals	40	23. Family tradition	22
10. <i>Cooking from the garden</i>	151	24. <i>Dwelling and resting (#4)</i>	58
11. Gardening as trial and error	22	25. Playground (#24)	6
12. Unpredictable gardens	12	26. Gardens as part of life	33
13. <i>Battling with the uninvited</i>	63	27. Home at present/self at present	27
14. Weather factors	14		

Each of the attributes serves as a major experiential theme encompassing several sub-themes.

Table 6-15 shows groupings of sub-themes and their frequencies. Figure 6-9 illustrates their distribution.

Results suggest that “Sensory stimulation” was the most frequently discussed experience, followed by “Sense of ownership”, “Awareness and orientation” and “Participation in meaningful activity”. The ordering is different from what the organizations and staff practice target at; as shown in the auditing results of organization and staff-resident interactions, “Social Interaction” is the top priority, and “Sense of ownership” and “Participation in meaningful activity” are overlooked. Reasons of not emphasizing the two aspects have been discussed in the above section; factors like inadequate staffing and a lack of knowledge may help explain the disproportionate focus.

“Social interaction” and “Familiarity” were not frequently brought up by the residents. One possible explanation is that interactions with family members, routine activities and familiar tasks in everyday space may be strongly taken for granted or be embedded or come along with other themes. For example, the sub-them, “family teamwork” describes that family members worked together to complete gardening tasks. Social interactions may occur naturally during the process. For example, Ella

(SL4) recalled that gardening days were her family time; her eight sisters and parents got together in their garden to work on a project; socialization undoubtedly came along with it.

Table 6-15. Groupings of sub-themes by the nine experiential attributes

PREFERENCE & ACTION			Summary of frequency
1	Privacy	• Dwelling & resting (58)	58
2	Social interaction	• Sharing food & information (38) • Playground (6)	44
3	Accessible space and built features	• Starting from scratch (56) • Physical demands (27)	83
4	Sensory stimulation	• Beautifying the house (51) • Interactions with pets or wild animals (40) • Cooking from the garden (151) • Relaxation (14)	256
5	Safety and security	• Food bank (74) • Family first (26) • Physical health (8)	108
PREFERENCE & KNOWLEDGE			
6	Familiarity	• Family tradition (22) • Gardens as a part of life (33)	55
7	Awareness and orientation	• Following rhythms of seasons (31) • Gardening as trial and error (22) • Unpredictable gardens (12) • Weather factors (14) • Learning new things (6) • Principles of better gardening (58)	143
ACTION & KNOWLEDGE			
8	Sense of ownership	• Dwelling and resting (58) • Battling with the uninvited (63) • Family teamwork (51)	172
9	Participation in meaningful activity	• Never-ending tasks (25) • A compliant place (5) • Doing everything yourself (4) • Self-value & satisfaction (50) • Home at present/self at present (27)	111

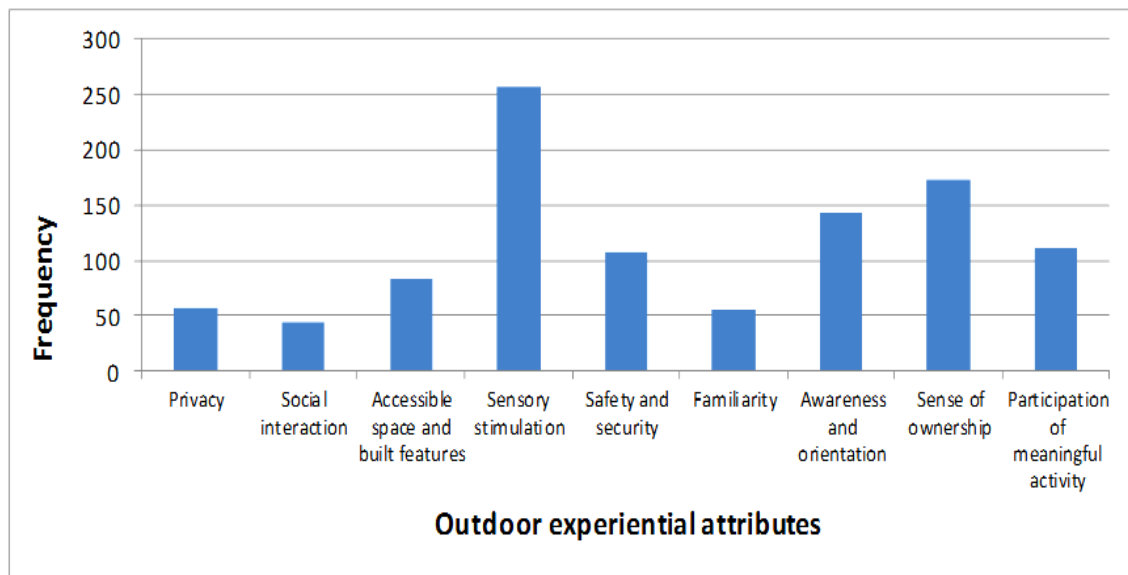


Figure 6-9. Frequency of the nine experiential attributes

In the following section, rationale behind the groupings is provided. Discussion is based on the theoretical framework reviewed in Chapter 2; it suggests that the nine experiential attributes are results of interactions between preference, action and knowledge. The 27 sub-themes embody these attributes, describing desired experience of outdoor environments.

Preference and action

Based on the discussion in Chapter 2, the following five attributes: “Privacy”, “Social interaction”, “Accessible space & built features”, “Sensory stimulation”, and “Safety & security” are described as results of interactions between preference and action. These attributes reflects dynamic between environmental evaluation and goal-oriented behavior in maximizing adaptation or survival probability.

1. Privacy:

Privacy in this theoretical framework is interpreted as experience of regulating sensory stimulation to maintain cognitive clarity or controlling information flow between self and others. The sub-them “dwelling and resting” describe people’s action of place-making in creating senses of

enclosure. Some residents built their own fence to separate their yard with neighbors' or made a screened porch to control visibility; their privacy was increased by reducing visual access and controlling sound. As described by the residents, activities at their patio were usually personal or family-based gathering. These activities often required a certain level of privacy. For example, Amber's (SL11) husband built a screened patio; it provided not only protection (helping reduce Amber's allergic responses to plants) but also seclusion.

2. Social Interactions:

"Social interactions" is described as experience of controlling initiation or termination of social engagement. The control, from Kaplan's perspective, is related to cognitive information-processing and is embedded with survival value. From Altman's view, the control reduces mismatch between personal expectation and reality. From Canter's perspective, it reflects evaluation (preference) of a place resulting from assessing the compatibility of personal goals with social rules. As described in "sharing food & information", people exchanged food and knowledge for better adaptation. Most of these interviewees' were born before and after the Great Depression; extra home-grown vegetables were shared with neighbors. Carol (SL16) stated, "I shared extra vegetables with them, and they shared with me." Chuck (GA2) mentioned, "My wife shared stuff with my neighbors. My neighbors would give me something back. My neighbor canned things too. They gave me some canned stuff." Food serves as a media in a very natural way to facilitate social connection. Adam's (SL13) daughter commented, "They had more senses of community back at that time."

Food receivers would also give something tangible as well as intangible in return. Ella (SL4) mentioned, "I grew vegetables. If the school wanted some, they could have some. I also had banana trees. When they grew too many bananas, I would take some to the school...School teachers would teach me how to garden." Wend (SL6) was a green thumb; she said, "My neighbors asked me questions, and I also asked them what they put in their garden sometimes. We exchanged information. I had good

friendships with my neighbors.” Jane (SL14) would take tomatoes to her church and share with people who need them. To these people, food and flowers initiated social connection with neighbors and even communities. During a sharing process, a social role as a green thumb, friend and community member was enhanced.

Social interaction between family members were described in topics related to “playground”; in some residents’ childhood memory, a home garden or farm was a play space of family members. The fun or playful parts of a home garden were related to spontaneous entertainment by wandering into nature or making something from natural materials. Judy (GA9) stated “My grand grandfather was a farmer too. He has a twin brother. They married sisters. I was just a little girl. He used to make a crown of dandelions for me. That was funny. They are weeds. When you blow the flowers, they fly... My brother, when he was a kid, he used to eat corn like a typewriter (laughing). It was funny. He loved corn.”

3. Accessible space & built features

The attribute is related to independent uses of outdoor environments. It is interpreted as control over how, when, and where to receive influence, support and assistance from others to achieve personal goals. “Starting from scratch” collects stories of how residents started their gardens from nothing and gradually built up a more accessible space by themselves. People removed rocks, trimmed bushes and broke grounds; they then planed garden space and went to a nearby nursery to pick up seeds or seedlings they like. They are both decision makers and also executers of their gardens. Plant support such as a wood stick, tomato cage or fence was added to prevent vegetables from falling over. One advantage of that was reducing body motion such as bending or kneeling in gardening. Maya (GA12) grew cucumber plants next to fence; she could easily get the cucumbers climbing up along the fence.

Some residents expressed that home gardening required a lot of bending and kneeling. As people were getting older, the incongruity between competence and challenge levels of a home garden became evident. Dolly (SL6) hurt her shoulder because she fell into tomato bushes. Jane (SL14) stopped

home gardening when she was unable to get herself out from a wheelchair and sit on the grass to get rid of weeds.

4. Sensory stimulation

Sensory stimulation is described as action of achieving desired quality or strength of stimulation. Guided by personal goals and social norms, the action aims to maintain better adaptation. Sensory stimulation here comprises several meanings. It implies not only Berlyne's or Ulrich's perceptual aesthetics (i.e., positive affect) but also Kaplan's cognition-based environmental preference (i.e., cognitive clarity) as well as Canter's concept of environmental evaluation (i.e., calibrating personal goal/roles in social context accordingly).

"Beautifying the house" reports residents' action of making their house more visually attractive; they would plan and select certain types of flowers to make their garden more appealing and also express their social identity. For example, many people liked red flowers. Martin (SL1) grew many roses and tomatoes; he said he is a red guy. He liked to cut roses—his favorite flowers and gave to his wife. The roses may represent Martin himself in expressing his love. Besides, a beautiful garden may imply that its gardener is a green thumb. Residents like Jane (SL 14) and Ross (GA 15) felt very proud of themselves when people were attracted by their flower gardens and gave compliments; people's response were validation of a good gardener.

Besides visual experience, a home garden also created olfactory and taste stimulation. "Cooking from the garden" describes how food was brought from one's garden to table. According to these residents, family's craving for fresh flavor motivated them to have a home garden. Most of residents were very confident that their home-grown tomatoes were much tastier than in-store tomatoes. To sustain the enjoyment and satisfaction of food through the winter, many people or their parents preserved food; they canned, sugared and acidified vegetables or fruits. To them, canned tomatoes, pickled beets, and apple jam were full of unforgettable flavors.

The taste experience was often linked with a role of caregiver— a mother, grandmother or wife. Chuck (GA2) described his mother was a good cook when recollecting tastes of his garden. “My mom made apple pies and jam. She was a good cook. She could cook anything. She also canned everything like peaches.” Many people like Chuck had strong attachment with home-made food and also someone who made it; action of “Cooking from the gardens” to these people may imply that “my home is (or I am) taken care of”.

Some residents identified themselves as a caregiver of home. A role of a mother or wife was manifested in the process of cooking from a home garden. Jane (SL13) said, “Did I give the food to the neighbors? No, my kids ate them. I have five kids. We had lots of vegetables because we all liked vegetables. I feed my kids with the vegetables I grew.” In the example of Jane, while sensory experience of her family was satisfied, her self-identity as a mother was enhanced.

Interactions with pets or wild animals were also parts of experience of a home garden. They would trigger visual, hearing and tactile stimulation. However, in some examples, a home garden was not always a place triggering sensory experience. Some residents felt that it was a place allowing being away from work or family. They enjoyed quiet and serene alone-time outside; being in their gardens helped balance over-loaded stimulation.

5. Safety and security

Safety and security is described as action of control over an area in need of freedom from danger and risk. The action is taken based on social norms, family value and personal goals. A topic of “food bank” suggests that a home garden provided basic survival needs— food. People could just pick up vegetables from their home garden whenever they needed, and preserved food helped families go through winter time. “Family first” describes that family’s need was satisfied first in plant selection, food distribution and ways of cooking. Flora (GA5) mentioned, “We didn't share things with neighbors. Food was just for my family.” In other words, garden-grown food had to ensure that no one was hungry in her

family. Tim (SL21) had nine siblings and recalled how his parents raised the family. “When you have 10 kids, you have to have everything.” Ana (SL15) also felt the same way. Her garden reflected how much she cared for family’s stomach. “Having gardens was the only way to have food we want... I didn't grow parsnips; kids didn't like it... I canned a lot of beets. They all liked beets.”

Besides food security, gardening was treated as a physical activity that would improve wellness. Fresh air was another factor perceived as beneficial. Although home gardening was a hard work, to some people, it would improve health and maintain a safe life.

Preference and Knowledge

The following two attributes: familiarity and awareness & orientation are interpreted as results of interactions of preference and knowledge in this framework. The interactions imply dynamic between pattern-based environmental knowledge and environmental evaluation related to probability of achieving one’s goal or better adaptation.

6. Familiarity

Familiarity in this model is viewed as experience of “making sense of a place”. It is experience that people accurately and quickly retrieve a cognitive map; it is also experience that people become rule-savvy (hidden or formal programs) when trying to achieve better satisfaction of environments. Having a home garden seems make sense to these residents because it is their “family’s tradition”. Mary (SL3) mentioned, “My parents had been growing things through years and years. They learned from their parents. Everybody had a garden many years ago.” Their grandparents and parents had a garden so they had a garden too. Jenna (EL3) pointed out, “I knew gardening because of my mother. I learned by watching her doing gardens.” Gardening to these people became a taken-for-granted routine and a manner of life.

A garden next to a house is part of one’s anticipation of a future home (an imagined cognitive map). Once they owned a house, they had a garden. Carla (EL2) recalled, “My mom used to have a

garden... I started gardening when I was married. I could have something to do.” Wendy (SL5) started gardening when she and her husband brought their first house; “My husband's grandparents knew how much I like their yard. When we brought our first house, they were willing to help and teach me about gardening. I also learned by myself.”

Many people felt that a home garden was a part of life. Erin (GA3) described an everyday routine in her parents’ farm; “We had horses and cow. We would feed horses with some corn every day...My mom raised chicken, red and white Leghorn chickens. She would pick up white eggs and brown eggs...We had cows, Jersey cows. They had white face. We used to milk them.” A garden evolved along changes of life. Amber (SL11) said, “After my husband died, I couldn't take care of the garden, no more. I sold the house in Texas and moved back to Wisconsin. “An abandoned home garden may imply a shift of social role and acceptance of a new routine or cognitive map. Like Jenna (EL3), her home garden was transformed along with changes of her role from a mother of a family, a tenant of an apartment, an assisted-living resident to a nursing home resident. The scale and content of her garden varied according to who she is and where she lives. She owned a large flower-vegetable garden at home and then indoor container gardens at her apartment. Afterwards, she and other residents shared a planting box in an assisted living. In the current nursing home she resides, there is only a raised bed for visual appreciation. Although the form of her garden changes, the mind of wanting to garden still remains.

7. Information Awareness & spatial orientation

The attribute is described as formation or utilization of pattern-based knowledge in environmental evaluation. The pattern is workable and socially-significant in the sense that helps optimize functioning. People are assumed to struggle for seeking constancy in living reality; the constancy is an organized or a set of variables to keep accurate estimation and to solve everyday problems. “Following rhythms of seasons” describes resident’s awareness of rhythms of seasonal changes and their rhythm-based home gardening. They were able to anticipate what will happen in the

next season and know what should be done. Most of the residents like Jenna (EL3) “cleaned up the garden in May and put everything down in October”; knowledge of seasonal patterns allows them to manage key aspects of gardening environments.

Awareness of seasonal changes is not enough. To have a productive garden, many factors need to be controlled. Four sub-themes, “gardening as trial and error”, “unpredictable gardens”, “weather factors” and “learning new things” describe residents’ attempt of figuring out a solution to unpredictable nature; Wendy (SL5) said, “I learned by mistakes. I tried several times to learn about gardening... When flowers didn't grow well, I felt disappointed. I tried to think where I did wrong.” The weather factor is the most ungovernable. Aggie (EL1) mentioned, “You do the best when the weather is hot; you water and take care of plants.” As Dolly (SL6) pointed out, “there is not much you can do when the weather is too hot or too cold.” The unpredictable garden sometime brought surprise. Jane (14) stated, “Sometime you thought you were planting something but it turns out to be another plant. Sometime, you didn't expect they can grow to such height.”

A successful garden was described as results of combination of different elements such as good weather, appropriate soil, healthy seeds, and a skillful and diligent gardener. To some residents, there was always a way to find a formula for reducing the loss or better control of gardens. Wendy (SL5) would pay attention to Sunday newspapers and TV programs about local gardening information; she also visited nurseries to ask questions and find better arrangement of different factors. New knowledge learned by mistakes and other sources can be applied to home gardens next year; Emma (SL7) said, “When things didn’t go well, I could try next year... You don't have much control over the weather but you can always try next year.” Emma actually suggested a-second-chance concept that people can try new things in home garden; a home garden thus provided something for anticipation; it expanded the gardeners’ horizons and motivated people to seek and keep involvement.

“Principle of better gardening” collects successful experience of dealing with unpredictability; it comprises workable knowledge derived from the residents’ life-time “case study” of their home garden. Dolly (SL6) suggested, “You have to clean up the garden because you don’t want to leave stuff behind; it may cause diseases. When you turn the soil, you put compost... You have to rotate vegetables and stuff every year... Make sure you have good soil! That is the number one thing. The second thing is using your space wisely.” Allie (GA1) had some observation of weeds; “You called it crabgrass but we call it St Augustine grass; it won’t die. It spreads but I never used sprays. Weeds have long legs. Some have short legs and they can’t live long.” Lana (EL5) cared about soil and suggested, “You need to have good soils to grow things. If you have too much clay in soil, you can mix topsoil with it. You can also use some weed killers to get rid of weeds.” These principles are organization of different factors (e.g., plants, soil, space etc.) in a knowledge map; the map was strongly anchored in the residents’ memory because it was so easily retrieved although the last time they gardened was about 20 years ago.

Action and Knowledge

Two attributes: “Sense of ownership” and “Participation in meaningful activity” are described as results of interactions between action and knowledge. They reflect experience of taking actions to understand and develop pattern-based understanding or “summary generalization” (Davidson, 2003; Polkinghorne, 1992); these patterns are significant for individual or societal functioning, helping achieve one’s goal.

8. Sense of ownership

The attribute is about experience of taking actions on environments in conveying “I own this place”. An owned place is where owners determine rules of place defining what is appropriate.

A personal marker is a useful cue to claim ownership (Altman, 1975). The marker, however, lies in consensual interpretation of it (Canter, 1991); its meaning is framed by different local programs (e.g., law, value or culture) (Weisman, 1983b). A home garden may serve as personal markers indicating this

place is occupied. As many residents recalled, they built dwelling and resting structures or provide furniture to accommodate personal or family-based activities in their gardens. Martin's (SL1) said, "We put furniture on the patio. We could see the garden from the patio. I had a grill for cookout. We sometimes had lunch and dinner at outside." Only people invited were able to join their outdoor party. Wendy (SL5) had no patio space; she randomly put chairs and tables at her driveway when she had friends coming over; she created her own rules of setting up a party.

Defending behavior such as battling with the uninvited is also a strong claim of ownership. These residents in general had a lot of experience of dealing with weeds, wild animals and thieves. Lana (EL5) recalled, "I pulled out weeds by hands. I also used some weed killers. If I couldn't pull out, I sprayed them...Weeds were very annoyed." Dandelions were agreeingly conceived as a major problem in home gardens. Allie (GA1) was angry at weed problem and said, "I felt mad at weeds. They kept coming back. I got them a damn." Paula's tomatoes were constantly eaten by some wild animals, and Tim (SL21) had to deal with poison snakes. Maya (GA12) had to watch her neighbors because she thought they stole her tomatoes.

The residents' home gardens were characterized by multiple-ownership. All family members would share works and enjoy results of hard garden works together. Mary (SL3) and her husband planned their garden as a team; they would go to a nursery together and pick up plants; "My husband would ask my preference of flowers and I would give him my advice." Ella (SL4) and her eight sisters would help their parents in gardens; she recalled, "I have eight sisters and we used to help in gardens. It was a family project. My dad knew how to do it. Days of gardening were my family time."

There was a clear job division of gardening work. Chuck (GA3) said, "My wife took care of the garden and I mowed the lawn and pulled the weeds. I had to move rocks so my wife could grow tomatoes." Adam's (SL13) daughter mentioned, "Gardening is kind of a joined thing. My dad would plow fields. Both my mom and dad would plant vegetables. My mom did a lot of watering because she stayed

at home and took care of kids. She gardened and they both weeded. Kids were stuck to do weeding too although we tried not to.” The multiple-ownership concept highlighted family teamwork or family cooperation in home gardening; in that concept, every family member is a caregiver and also care receiver when they enjoy garden-grown food.

9. Participation in meaningful activity

Meaningful activities are related to activities that increase senses of personal value—feeling useful (Kaufman, 1993; Kiyota, 2009; Thomas, 1996). The usefulness suggests that one can solve problems by using his or her existing knowledge; the knowledge comprise several workable patterns for achieving personal goals related to one’s social role. A meaningful activity to a person thus has practical value and reflects one’s identity or responsibility.

To these interviewees, maintaining a home garden was practical in a way that helps sustain a family. They or their parents were care givers of home and home gardens; one responsibility of a gardener was to deal with never-ending tasks. For example, Emma (SL7) said weeds grew every day, and “you have to do something with them every day”. Carla (EL2) recalled, “I used to work in the garden for a couple of hours in every morning... I used to think of things that need to be done when I looked at my garden.” Jenna (EL3) gave a similar comment, “There was never enough time. I used to spend at least an hour a day and several days a week. I would garden in the morning or evening depending on children’s schedule.”

The way they perceived themselves reflects a strong work ethic— an attitude that hard work and diligence is primarily virtuous. It is related to an attitude of “doing everything yourself”. Adam’s (SL13) daughter described her father as a master of everything; “he planted his own trees; if his trees dies, he dug out by himself with a truck after a truck after a truck...He was kind of doing-it-yourself person...He can do electrical, plumbing and woodworking. He was a master of everything.” Ana (SL15) perceived herself as a person who is capable of making everything. She mentioned, “I did a lot of

gardening. I did a lot of things. I was interested in art for a while. I made my two lamps and put them together. The shade didn't come in time. If I got shade, the lamps would be complete and I would get the first price. I got a second price. I liked to paint. My husband never painted the room but I painted the whole house. I would do anything I could do in my hands. I also did a lot of sewing. I made my children's clothes. I knitted. I made their sweaters. I made my two daughter's wedding gowns with long train and beads. I made my husband's jacket."

Although they were getting old and retired from gardening, some residents still show a strong attempt of doing somethings and make themselves useful. As Jenna (EL3) further explained, "I like to keep myself busy in all different types of things." Ekerdt (1986) may call such attitude and expectation as "busy ethic", driven from continuity of moral standard and justification of social roles.

"A compliant place" describes another ethic aspect or social expectation of being a mother in home gardening. Ana (SL15) described, "My kids didn't care about peas and my husband didn't care either. If I wanted some, I went to stores to buy some. I grew something my family likes. I won't force them to eat something if they didn't like it." Ana's statement revealed a stereotypical image of a mother— an altruistic or sacrificing caregiver. Emma (SL7) used to work on her garden after she took care of her kids and family chores, and Jenna's (EL3) gardening hour depended on her children's schedule. Beth (SL10) used to compromise her taste of food; she recalled, "My kids didn't like garlic. I put a little bit garlic in cook. It was not enough to get their attention."

People's hard work and compromise were worthy of reward. Besides food, there was psychological feedback— "self-value and satisfaction". A home garden might have added self-esteem and enhanced self-identity to these residents. Emma (SL7) said, "I felt good and proud when we enjoyed vegetables I grew by myself on the table. I also felt happy when things grew so well." Aaron (SL8) can still vividly describe his father's work in their farm; "I still remember that my dad took a lot of pride of what he had been doing in his farm." When enjoying garden-grown food, people tasted a sense of self-

achievement. Jane (SL14) mentioned, “I just felt self-achieved. The food was so good. If I wanted to eat, I could just go to the garden and grab some... If everything grew so well, it was a great accomplishment. We used to bring flowers in the house and eat fresh vegetables. It was good to have things you made by yourself. I felt proud of myself too.”

Home gardening was particularly meaningful to Gale (GA6); she felt satisfied and showed gratitude for her garden. She commented, “You would have feedback, self-worth and pride by doing gardening. You definitely get your fulfillment from the garden, the food and fresh taste... In the gardening concept itself, you know you are going to get something back from your input. It is a circle.” Gardening seems to shape her outlook on life, a broader perspective in looking at herself in relation to nature. Gale explained, “If things grow so well, you want to thank Mother Nature because you are not doing by yourself. There is a lot of involvement; it is not just your effort. You cannot control everything.”

The meanings derived from home gardening were forced to be modified when they were relocated to a place allowing no gardening activities. Many people expressed they miss their gardens, fresh vegetables, animals and opportunities of doing things. Jenna (EL3) said, “I miss my garden. I miss that I was able to do gardening on my own. I could watch things growing and materializing.” Lana lamented the loss of his past life; “I miss my wife and also my garden. They were a part of my life.”

Acceptance of reality reflects a way of looking at self at present. Emma (SL7) commented, “I never stopped doing garden until I felt it was hard to do. I really love gardening and see things growing... I can't do gardening now. I am in a wheelchair.” Jenna’s Scoliosis stopped her from doing gardening; “it gets worse now because I always sit in the chair. It did bother my back. Of course, my knees hurt too. It is very difficult to me to bend my body.” Molly (SL20) perceived few chances to approve that she is a good cook in her current home; “My favorite thing is cook. I used to cook things grown from my garden. I love cooking but I don't have any chance now. I live here.”

Not all the residents felt pessimistic; Amber (SL11) seems to regain her self-value through sharing recipe with staff. She described, "I miss my garden, I miss that I can do things and I miss my baking. One time, I wanted to price my brownies but I was unable. When I came here, my relatives threw all my recipes away so I don't have them...I had a recipe of peanut butter cookies I learned from a magazine. I shared it with staff here. It only takes three ingredients: one cup of sugar, one cup of peanut butter, and one egg. You mix them all together and place them on an ungreased cookie sheet. You bake them with 350 degree for eight to ten minutes. That's it."

At the end of interviews with Allie (GA1), she expressed that "a house is not a home if it has no garden." The three nursing homes have a courtyard with garden space in it. The issue of whether it adds a sense of home is nothing related to its size or appearance. To Allie, it is an opportunity of engaging in meaningful activities that enhance who I am, what I can do and how I make it.

CHAPTER 7 : PLACE RULES OF THE THREE

NURSING HOME COURTYARDS

Chapter 5 discussed physical settings of the three cases. The three physical settings are embedded with a particular scheme and convey cues that certain attributes and behavior are preferred. Chapter 6 described the three organizations in terms of a mix of explicit rules of what a courtyard is ought to be. Based on Silverstein and Jacobson's (1985) concept, these physical cues, organizational philosophy and expectation can be viewed as "contextual rules" influencing core rules and internal rules (Figure 7-1). This chapter reveals "internal rules". They are instrumental organizations of a courtyard reflecting social logic of people acting upon the environments (Canter, 1991). These rules are composed of goal-orientated behavior guided by a mixture of laws, regulation, customs and habits (Canter, 1991). Based on Moore's (2000) study on hidden program of adult day care, a set of internal rules with similar goals forms a "core rule". The core rule itself represents a pattern or an organizing scheme that captures all parts and relations and gives meaning and scope to a place. The core rule shapes place experience and resonates with contextual rules.

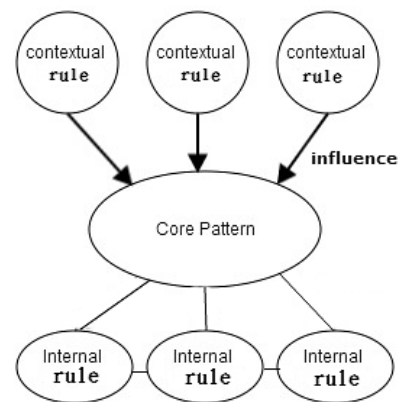


Figure 7-1. System of place rules. Modified from Silverstein & Jacobson (1985)

To collect internal rules, behavior in the three courtyards was observed in 2013 using a behavior checklist and behavior map (Appendix L). Snapshot observations were conducted with a 30-minute interval. During the interval, field notes were taken. The observation data was analyzed with two steps. First, raw data collected from the observation checklist

was input into SPSS. General patterns of courtyard use in terms of person-times, users' characteristics, and activity types are generated. Second, results of behavior mapping and field notes were translated into descriptive narrative of place rules and analyzed with descriptive and pattern coding processes.

I. Internal Rules of Silver Life's Courtyard

A. General patterns of courtyard uses

Behavior observation was conducted in June, 2013 at Silver Life. It took seven days and a total of 43 hours. Data include 803 person-times of courtyard users and their behavior. Most of courtyard visitors were residents (58.16%, 467 person-times), followed by family members and staff (Table 7-1). On average, there were 10.86 person-times of resident users, 4.98 person-times of family visitors and 2.84 person-times of staff per hour. Over 80 percent of resident users are female and most of them are wheelchaired (Table 7-2). In terms of group types, over half of the resident users had no company, and the rest of them were in family-led or staff-led groups. Very few resident-led groups were found in the courtyard (Table 7-3).

Table 7-1. Person-times of Silver Life's courtyard users

	Resident	Family	Staff	Total
Person-times	467 (58.16%)	214 (26.65%)	122 (15.19%)	803

Table 7-2. Gender and mobility of resident users in Silver Life

	Male			Female		
	83 (17.77%)			383 (82.01%)		
	Ambulatory	walker	Wheelchair	Ambulatory	walker	Wheelchair
Person-times	11 (13.25%)	20 (24.10%)	53 (62.86%)	8 (2.09%)	45 (11.75%)	330 (86.16%)
Mobility of overall resident visitors						
	Ambulatory		Walker	Wheelchair		
Person-times	19 (4.07%)		65 (13.92%)	383 (82.01%)		

Table 7-3. Outdoor residents by group types of Silver Life

	Group types				Total
	Individual residents	Residents in groups			
		Family-led	Staff-led	Resident-led	
Person-times	244 (52.25%)	116 (24.84%)	74 (15.84%)	33 (7.07%)	467

The seven days of data collection includes five weekdays and one weekend. Individual residents dominated the courtyard in each observation day (Table 7-4) (Figure 7-1). The greatest person-times of individual residents were found on Monday, June 10th; it was a sunny and breezy day with an average temperature between 78 (shade) and 87.5 (sun) and wind speed of 2.49 mph. More family groups but fewer individual residents showed on weekends. According to staff, some family members take residents out for lunch on Saturday so the courtyard has fewer visitors. Frequency of residents in family-led groups was relatively higher on Thursday, June 04th because of a family cookout party; some residents were invited to the party at the courtyard. Staff-led activities were not common. The highest frequency of residents in staff-led groups showed on Tuesday, June, 11 because of an outdoor drawing class.

Table 7-4. Group types by days in the courtyard of Silver Life

		Days							Total
		Monday June 03	Tuesday June 04	Thursday June 06	Saturday June 08	Sunday June 09	Monday June 10	Tuesday June 11	
Person- times	Individual	34	19	30	19	38	57	47	244
	Family-led	6	11	23	18	28	12	18	116
	Staff-led	2	8	3	1	4	10	46	74
	Resident- led	15	6	6	0	4	2	0	33
	Total	57	44	62	38	74	81	111	467

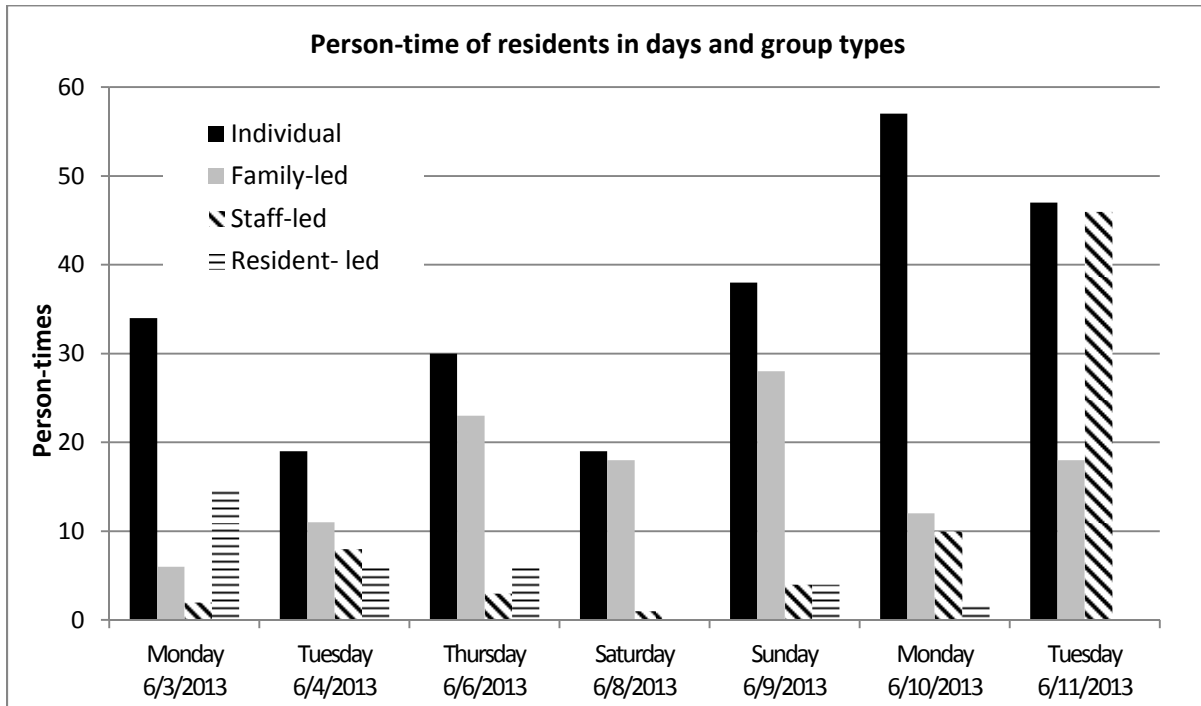


Figure 7-2. Group types by days in Silver Life

Residents started using the courtyard after breakfast (7:30 to 10 am). Not many family members and staff appeared before 11:00am. Peak hours began one hour before lunch time (11:45 to 12:30 pm) and last until 4: 00pm. Staff started bringing residents back to their room around 4:00 pm. When the weather was permitting, some family members and residents sat at the courtyard after dinner (dinner time: 4:45 to 5:30pm) (Table 7-5). Major activities in the courtyard were just passive interactions with environments characterized by no or minimum change of surroundings. The most common activity is “walking through the courtyard” (25.3%), followed by “observing nature and people”, “group talking” and “napping or disengaged status”. There were some active interactions with environments such as “light gardening”, “organizing/cleaning environments” and “arranging furniture” but their incident rate is low as compared with that of other activities (Table 7-6)(Figure 7-3).

Table 7-5. Total person-times of courtyard users by time in Silver Life

		Time									Total
		9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	
Person-times	Resident	3	28	49	44	89	104	79	61	10	467
	Family	2	16	29	31	39	40	30	24	3	214
	Staff	2	11	26	25	21	13	16	3	5	122
Total		7	55	104	100	149	157	125	88	18	803

Table 7-6. Types of activity observed in Silver Life's courtyard

Activity		Person-times	Percent
1	Gardening	4	0.6%
2	Arranging furniture	1	0.1%
3	Organizing/cleaning environments	21	2.9%
4	Spontaneous talking	60	8.3%
5	(Individual) drinking/eating	4	0.6%
6	(individual) walking and observing	5	0.7%
7	Observing nature/people	159	22.1%
8	Group talking	110	15.3%
9	Family BBQ/picnic	10	1.4%
10	(Group) walking and observing	4	0.6%
11	Drawing class	34	4.7%
12	Napping/disengaged status	75	10.4%
13	Reading	16	2.2%
14	Listening to music	14	1.9%
15	Passing through	182	25.3%
16	Reality orientation/reminiscence activity	6	0.8%
17	Using a cellphone	5	0.7%
Total		720	100.0%

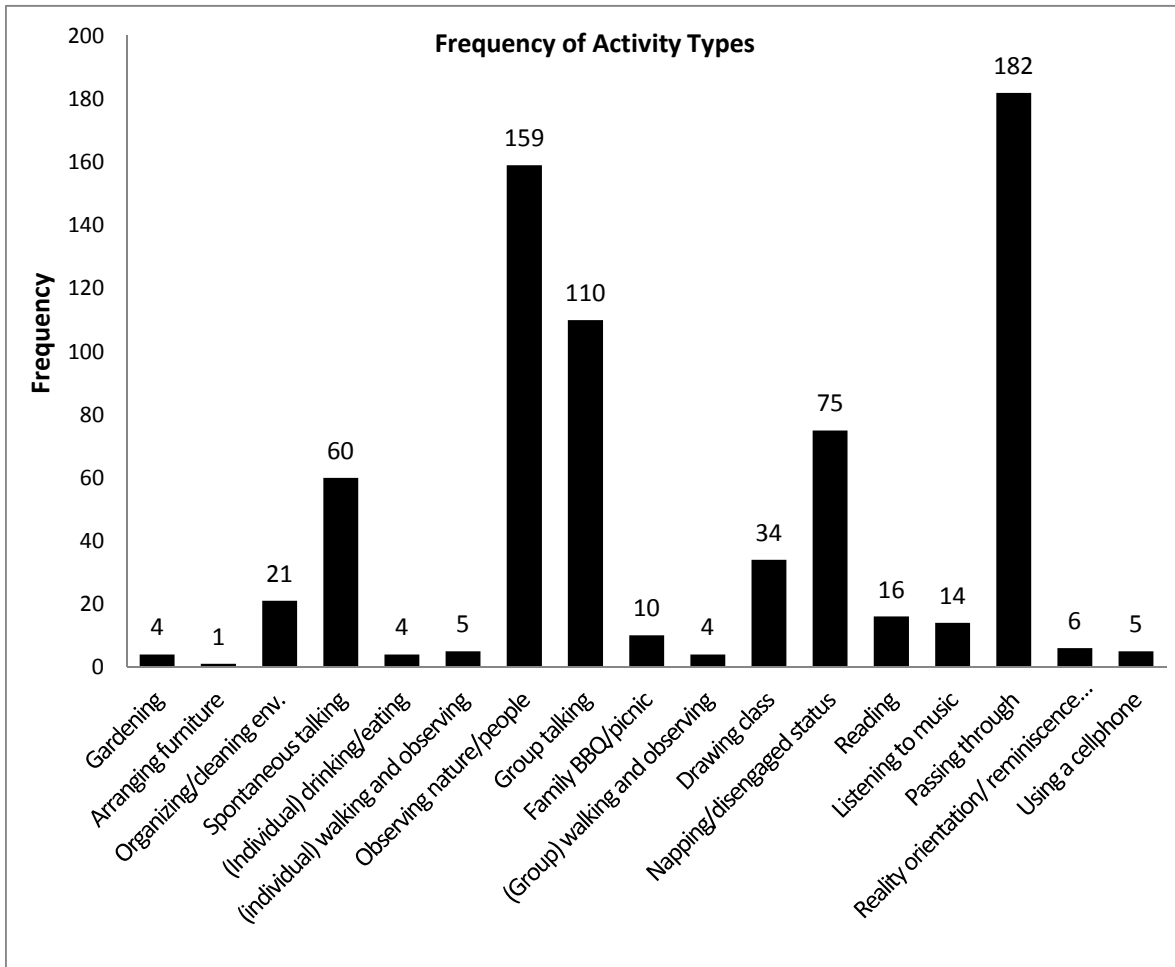


Figure 7-3. Types of activity and their frequency in Silver Life's courtyard

B. Pattern of rules

A total of 100 different rules were found. Rules with similar goals were grouped and formed in 25 coded segments (Appendix N). Nine sub-themes emerged from the codes including 1) staff as providers & residents as receivers, 2) little control of information, 3) extension of indoor space, 4) unobtrusive surveillance, 5) things getting easy, 6) people out there, 7) balancing sensory experience, 8) what's new, and 9) discontinuation of past habits (Table 7-7). Each sub-theme is seen as a component consisting of a multi-level structure.

Table 7-7. Sub-themes of rules observed in Silver Life

Sub-theme	Coded segments	# of rules
1 Staff as providers & residents as receivers	<ul style="list-style-type: none"> ▪ Maintenance ▪ Service delivery ▪ Passive activity ▪ Marketing 	15
2 Little control of information	<ul style="list-style-type: none"> ▪ Levels of visibility ▪ Flow of personal information ▪ The extent of information awareness 	14
3 Extension of indoor space	<ul style="list-style-type: none"> ▪ A place of care/activity programs ▪ Accommodation of activities 	7
4 Unobtrusive surveillance	<ul style="list-style-type: none"> ▪ Observation from indoor spaces ▪ Courtyard as a shortcut ▪ Passersby's greeting 	7
5 Things getting easy	<ul style="list-style-type: none"> ▪ Free use of furniture and accessories ▪ Free access 	12
6 People out there	<ul style="list-style-type: none"> ▪ Spontaneous socialization ▪ Control of interactions ▪ Less restriction ▪ Passing time 	15
7 Balancing sensory experience	<ul style="list-style-type: none"> ▪ Vision, touch and hearing ▪ Smell and taste ▪ Weather adjustment 	17
8 What's new	<ul style="list-style-type: none"> ▪ Exploring things ▪ Knowing what happened 	7
9 Discontinuation of past habits	<ul style="list-style-type: none"> ▪ Familiar and active activities ▪ A not-so-ideal courtyard 	6

1. The nine sub-themes of implicit rules

1) Staff as providers & residents as receivers

This sub-theme includes 15 rules describing a care giver-receiver relationship in the courtyard. These rules are related to maintenance, delivery of service, residents' passivity and marketing value of the courtyard. In terms of maintaining gardens in the courtyard, staff took care of everything, and residents were not encouraged to dig soil or water plants. There was no assistive gardening tool (e.g., an adaptive and lighter watering can) or raised space to facilitate gardening. Residents were not expected to be active but passive viewers of outdoor landscape. Behavior in the courtyard like talking, reading, observing and napping are preferred.

Example:

Maintenance	SL.1.	Maintenance staff mow the lawn, clean the courtyard and replant flowers.
Service delivery	SL.4.	Nursing staff are to check residents at the courtyard when they need to take medicine. If residents are willing to stay longer, they will bring medicine to them. If residents need to go to the bathroom, staff will push residents back.
	SL.10.	Kitchen staff deliver meals to residents who order an outdoor lunch or breakfast. They also clean up tables after residents leave.
Passive activity	SL.14.	Residents are expected to engage in sedative activities. Most of residents in the courtyard are either talking to others or observing or taking a nap.
Marketing	SL.15.	The courtyard is one stop of a tour in Silver Life. Services and activities in the courtyard are highlighted in the tour.

In the courtyard, staff checked residents' need and delivered service to the courtyard; when residents asked for water, sunglasses, outdoor lunch and assistance in movement, staff gave immediate responses. The interaction makes an on-site water dispenser unnecessary since staff will provide water. From staff's perspective, a free-access water dispenser may have some safety concerns; residents with kidney issues or other diseases should not drink too much water. In other words, liquid intake of the courtyard users is controlled by staff. Such staff-resident relationship will work if there is a regular staff visit. However, in reality, staff did not visit the courtyard on a regular basis so there were times that no staff was around; to get drinking water, residents had to discontinue outdoor activities and find staff or

go back to their room. Residents who are allowed to have free access to water were given little control in body comfort; if staff are busy, waiting for assistance will be unavoidable.

The caregiver-receiver context created a staff-controlled courtyard and highlighted an image of “good customer service”. It was an important stop of a tour in Silver Life, showing that residents are well served.

2) *Little control of information*

This sub-theme includes 14 rules related to level of visibility, control of personal information and information awareness in the courtyard. The courtyard is spacious (15,720 square feet) but activities are limited to the central patio (2,170 square feet). As described in Chapter 5 (Physical Settings of the Three Courtyards), the patio creates only 22.7 square feet per bed for outdoor activities. Conversation between residents and family members can be easily overheard. In addition, residents were not free from public observation. No screened seats such as benches in a lattice arbor were provided; People often sat at the edges of the center of the patio to avoid attention.

Staff may help maximize residents’ information awareness, providing information of activities, choice of seats in the sun or shade, or options of lunch locations. However, not all nursing staff have same practice. Some staff did not provide choice of going back to the courtyard after bringing residents to the bathroom; activities they carried in the courtyard were thus discontinued.

Example:

Levels of visibility	SL.16.	Most of the individual users choose to sit at the edge of the patio observing nature and people.
Flow of personal information	SL.18.	Residents and family members may talk about personal information like money and health. Their conversation can be easily heard.
The extent of information awareness	SL.20.	Some staff ask resident’s preference of sun and shade before positioning them in the courtyard.
	SL.21.	Some staff ask residents whether they like to come back to the courtyard after bringing residents to the bathroom.
	SL.24.	Staff offer choices of having outdoor lunch at the courtyard in summer.

3) *Extension of indoor space*

This sub-theme comprises seven rules focusing on accommodation of activities. Like a typical indoor social space in Silver Life, the courtyard patio is well-furnished. Five umbrella chair-table sets facilitate group gathering. The table is heavy but chairs are movable. Several chairs and coffee tables accommodate individual or small-group activities; they were arranged for a two-person setting or individual contemplating spot at different corners of the patio. The coffee table can be easily dragged by residents to where they sit.

When the weather was permitting, the courtyard patio was set up for a group activity or physical therapy. The former is a part of activity programs, which usually took 30 to 45 minutes. Activity staff arranged chairs in a circle with a staff member or an object at the center. The latter was a spontaneous and one-on-one exercise lead by a therapist. It usually required no effort in re-organizing furniture.

Example:

A place of care/activity programs	SL.30.	The courtyard is used as a place for arm and hand exercises for rehab by a therapist.
	SL.31.	The courtyard is set up for structured activities such as a drawing class or tossing ball.
Accommodation of activities	SL.32.	Umbrella chair-table sets accommodate family-led or staff-led group gathering.
	SL.35.	Family members or residents can easily drag chairs and coffee tables to where they like. Umbrella tables are heavy; they remain in the same place.

4) *Unobtrusive surveillance*

The sub-theme contains seven rules related to surveillance resources. The courtyard is kept under indirect surveillance in several ways. First, the courtyard is visible from a main corridor; staff gave a quick check while walking through the corridor for work. In addition, an activity alcove at that corridor has a picture window looking at the porch and patio. It is a popular social spot where many spontaneous social interactions start. People who gathered there help observe residents at the courtyard. Second, the courtyard shortens walking distance between two corridors. People who used it as a shortcut helped

monitor the courtyard. Some staff gave a more direct interaction while walking through the courtyard; they checked if residents need water, sunglasses, clothes or assistance in going to a bathroom. Third, staff sometime conversed with residents about daily life in the courtyard. The activity staff helped water the plants and speak to courtyard users randomly. The administrator sometime brought her dog to the courtyard and chatted with residents and family members.

Example:

Observation from indoor spaces	SL.37.	The courtyard is visible from a main corridor; staff give a quick check while walking through the corridor for work.
Courtyard as a shortcut	SL.38.	Staff and family members constantly use the courtyard as a shortcut between corridors in summer.
	SL.39.	Residents mainly use the courtyard as a shortcut to the activity room, dining room and OT/PT room.
Passersby's greeting	SL.41.	Staff walk through the courtyard and greet residents with offering water, sunglasses, clothes or assistance in movement.
	SL.42.	Some family members who pass through the courtyard greet or offer help to residents.

5) *Things getting easy*

The sub-theme includes 12 rules describing free use of furniture and free access to space. In the courtyard, residents and family arranged furniture freely and invented new ways of using it. For example, a coffee table was used as a footstool or chair, and two coffee tables were placed together as a larger table. Family members opened or closed umbrellas on tables based on their need. They used facility's gas grill with staff's help. They watered plants with hoses or watering cans when they felt necessary.

Two power doors allow free and easy access to the courtyard during the day. Wheelchaired residents hit wheelchair touch pads without any difficult and went through the doors without hurry. A maneuvering space is preserved in front of vegetable and flowers containers, allowing residents to find their best angle of checking plants. These containers are high enough to facilitate observation and light gardening such as deadheading and weeding. Some obstacles regarding transportation were found. A geriatric chair was stuck in a crack of pavements. Nursing staff who walk through the courtyard helped

lift it over the crack. In addition, a threshold at the entry required more efforts from residents on a self-propelled wheelchair.

Example:

Free use of furniture and accessories	SL.44.	Family members and residents arranged chairs and coffee tables freely or invent new functions.
	SL.45.	Family members close or open umbrellas based on their need of sun and shade.
Free access	SL.50.	Residents access to the courtyard independently through two wheelchair power doors.
	SL.52.	Wheelchaired residents deadhead plants grown in containers without bending their body.

6) *People out there*

The sub-theme contains 15 rules regarding people's interaction in the courtyard. When the weather was permitting, the courtyard was a place for social interaction. Spontaneous conversation was easily triggered in the courtyard; some residents talked about container gardens with whoever sits next to them. They then started reminiscing life in farms and home gardens. Some family members who passed the courtyard also initiated simple conversation with residents; topics were always about the weather. Some residents took the initiative in forming a group. For example, Ana invited one resident to join a talk and said, "Why don't you join us... So tell us what your name is?" Bill then walked to the group and stared introduced himself. Jane talked to a resident with a book about a novel she read before, and then they started exchanging information of authors they like. Isabelle asked staff to encourage more people to visit the courtyard. She said, "I don't understand why people want to sit in front of TV and not enjoying the weather and people". She and another resident constantly had outdoor lunch tougher at the courtyard and enjoyed being surrounded by people. Given opportunities of meeting with other people, residents liked to pass the time in the courtyard before they went to lunch, dinner or other activities. For example, Jane stopped by the courtyard briefly before Bingo, and then visited the courtyard again after the game to share how she wins the game.

The courtyard offered a less restrictive social atmosphere. It was often found that family members talked and laughed loud, and residents seemed to feel fine with it. Toddlers playing in the courtyard screaming was not intervened or complained. Instead, they caught residents' eyes and brought on cheerful faces. In a structured activity, participants were allowed to withdraw, leave, or join the activity halfway. Residents with wandering or "going home" behavior were given positive distraction through interacting with nature and people; they were not forced to continue the activity.

Example:

Spontaneous socialization	SL.56.	Residents talk with other people spontaneously.
	SL.62.	Some family members walk through the courtyard and initiate simple conversation with residents.
Control interactions	SL.64.	Residents propel themselves to other people for conversation.
	SL.62.	Individual residents form social group spontaneously.
	SL.63.	Some residents initiate conversation about flowers in the courtyard or books they are reading.
Less restrictive social atmosphere	SL.67.	It seems acceptable that two toddlers play in the courtyard with sounds of screams.
	SL.68.	Some family members talk and laugh loud.
	SL.69.	In a structured outdoor activity, participants are allowed to withdraw, leave, or join the activity halfway; they are not forced to continue the activity.
Passing time	SL.70.	Some residents pass the time in the courtyard before going to an activity.

7) *Balancing sensory experience*

The sub-theme consists of 17 rules regarding people's sensory experience in the courtyard. Some types of sensory stimulation were provided by staff and family members. For example, activity staff turned on background music or invited a music band to perform. They also planned a party and served food and drinks. Some family members pushed residents to see blooming flowers and check bird feeders. They may picnic or have a cookout, providing different selections of foods other than institutional meals. Jane's niece grew a lot of cherry tomatoes and brought her two bags of those. She said, "I like cherry tomatoes and just ate them like crazy last summer".

Self-initiative sensory experience was also carried in the courtyard. Some residents touched plants and made deadheading. Few of them picked up chive leaves or tomatoes and tasted them right

away. Besides, residents made their lunch delivered to the courtyard so they could enjoy food, blue sky and people's talk at the same time. Some residents were very sensitive to the temperature. To keep thermal comfort, they moved their chair to follow the shades or sun. Many of them sat with one half of their body in the shade and the other half in the sun or sat in the partial shade under ash trees.

Example:

Vision, touch and hearing	SL.71.	Most of residents observe people and nature.
	SL.72.	Some family members push residents to check flowers and vegetables.
	SL.75.	Activity staff may turn on background music for more than two hours.
Smell and taste	SL.76.	Lilac bushes provide intense fragrance in summer.
	SL.79.	Residents make their lunch delivered to the courtyard. Family members eat lunch at the courtyard.
Weather adjustment	SL.81.	Residents who like full shade stay in the tent and umbrella tables. People who like partial shade sit under ash trees.
	SL.82.	Residents sit with one half of their body in the shade and the other half in the sun.
	SL.84.	Residents move with the shade or sun.

8) What's new?

The sub-theme includes seven rules describing visiting the courtyard as a venture. The courtyard gives residents opportunities to explore new things. For instance, some residents liked to birdwatch and observed how baby birds are raised. Others paid attention to new plants or wild flowers. For example, a staff planted a moonflower in the courtyard, and many residents were impressed by the strong fragrance when its flowers bloom in the evening. Jane even asked her daughter to search information online about this plant. Silver Life's architecture layout allows residents to know what happened in the courtyard. Bill, the resident who constantly sat at the activity alcove of the main corridor said, "It is so windy outside. See trees were blown back and forth!" He watched motion of trees, checked the amount of outdoor users and decided whether he should go outside. Sometimes good observation is an advantage in competition of resources; when a space with full shades and nice view was empty, residents filled the spot so quickly. When tomatoes ripened, people with good eyes and fast hands won chances of tasting the garden-grown food.

Example

Exploring things	SL.88.	Some residents know where a best location is to watch birds nesting in the courtyard.
	SL.89.	Some residents are curious about wild flowers and new plants and like to know what they are.
Knowing what happened	SL.91.	When a space with full shade and a nice angle of observing people is empty, residents fill the spot quickly.
	SL.92.	Residents who sit at the activity alcove in the main corridor are able to preview the courtyard before taking an outdoor venture further.
	SL.94.	Residents exchange information about the facility, community and country in the courtyard.

9) Discontinuation of past habits

The sub-theme consists of seven rules regarding discontinuation of familiar activity. Activities related to home gardens such as gardening, feeding birds, making flower bouquets and processing and sharing food cannot be carried out in the courtyard. Although residents were allowed to do very little weeding and deadheading, few resources accommodated the leisure interests. Family members were given more autonomy; they may execute residents' control of environments by adding a birdfeeder, flower basket or decoration outside of residents' windows. However, residents who have no family's help were less likely to watch birds closely or to ornament surroundings based on their own preference. In other words, the courtyard was not always presented in a way that matches what residents want. For example, residents hoped some flowers they saw last year would come back in spring. However, residents had little input in flower selection. In the current staff-controlled environments, the administrator's rather than residents' ideal and familiar garden was realized.

Example

Familiar and active activities	SL.95.	Residents are allowed but not encouraged to do light gardening such as weeding and deadheading. Very few residents engage in the activity.
	SL.97.	Family members may add a birdfeeder, flower basket or decoration outside of their window. They are responsible to take care of these features.

2. *Pattern: an outdoor-café*

The nine subthemes are interrelated (Figure 7-4). Their relationships are interpreted as results of interactions between two interdependent rule clusters: one personal and one environmental. Personal rules are related to individual goal-oriented behavior reflecting residents' personal experience, expectation, living principles or family value. Sub-themes such as "people out there" and "balancing sensory experience" belong to this category. Environmental rules are rules corresponding to organizational philosophy, care protocol and characteristics of physical settings. Sub-themes such as "Staff as providers vs. residents as receivers", "things getting easy", "little control of information" are in this level. The two sub-systems vibrate together in resonance between "people out there", "what's new" and "unobtrusive surveillance", creating an "outdoor-café"- like atmosphere. It is very gregarious, communicative and neighborly; food and water is well-served but it has little affective sharing with residents.

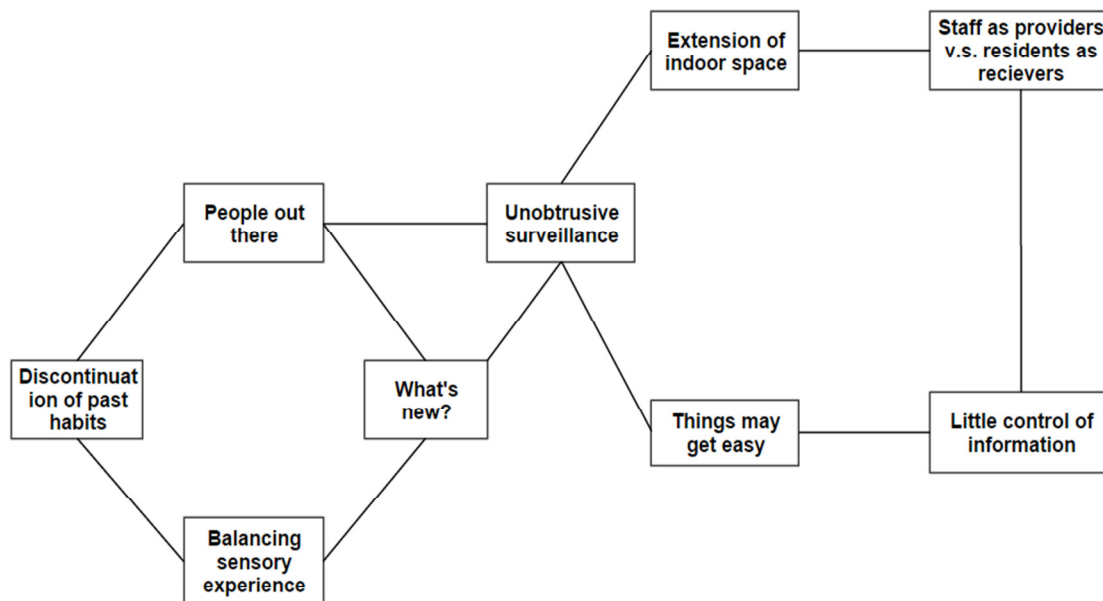


Figure 7-4. Pattern of internal rules in the courtyard of Silver Life

More specifically, the courtyard facilitated spontaneous social interaction; many self-initiative social groups were formed, providing cognitive-stimulation to meet residents' need; conversation related to family, home, farms or gardens may trigger reminiscence and help recollect a past social role as a green thumb or good cook (theme #6: people out there). Through meeting with people, residents may receive updated information regarding the courtyard, facility and community (theme #8: what's new?). In the courtyard, residents also interact with natural material that may trigger visual, olfactory, touch and taste sensory experience (theme #7: balancing sensory stimulation). Activities such as checking new flowers and discovering baby birds may lead to a new venture to the courtyard (theme #8: what's new?). However, some activities that people used to carry in home gardens were not carried over in the courtyard. As revealed in Chapter 6 (see the section of residents' home garden experience in Silver Life), taking care of vegetables and sharing garden-grown food were essential to their home gardens. However, it was less likely to accommodate or enable these familiar routines in the courtyard here (Theme #9: discontinuation of past habits).

The courtyard enhances a residents' role as a care receiver; residents receive care, activities, and schedule arranged by staff (theme #1: staff as providers vs. residents as receivers). Such environments ensure staff's control and maximize safety and security. To allow staff to make a quick check of the courtyard, no screened seats were provided to block staff's view; however, residents' control of privacy is compromised. They are not being free from public observation, and have no way to prevent conversation from being overheard (theme # 2: control of information).

The courtyard requires little staff's direct supervision because it serves as a shortcut between two corridors. Staff or family members would take a quick glance while walking through the courtyard (theme # 4: unobtrusive surveillance). They are like passersby walking through a hallway rather than "inspectors". Besides, staff may lead an activity in the courtyard or deliver care to courtyard users (theme #3: extension of indoor space); they help monitor the space while carrying out tasks. These

passersby and caregivers sometime become enablers of accessible environments (theme # 5: things getting easy). They help wheelchaired residents in getting through pavement cracks.

The center of the system is characterized by dynamics of three rule sets: “people out there”, “what’s new” and “unobtrusive surveillance”. Staff, family and other people passing through the courtyard ensures courtyard safety and catalyzes spontaneous conversation; surveillance is normalized and considered less pointed. Likewise, social interaction in the courtyard is less restrictive, showing more flexibility in welcoming random and spontaneous conversation, which makes staff’s inquiries less targeted and disturbing. In other words, two types of needs (i.e. surveillance and social interaction) are accommodated, and two groups of rules harmonize with each other.

C. Linkage of the experiential attributes

A total of 100 rules (Appendix N) are grouped under the nine experiential attributes. Rules in each attribute are evaluated as being negative or positive to the attribute. Results of evaluation are shown in Table 7-8 and Figure 7-5. Unsurprisingly, the rule system is in favor of three attributes: “Social interactions”, “Safety and security” and “Familiarity”; no particular rule is found to against people’s interactions in the courtyard. Attributes that are overlooked or compromised (few positive and/or more negative rules) include “Privacy”, “Accessible space and built features”, “Sense of ownership”, and “Participation in meaningful activities”. No rule is found to support “Sense of ownership”.

One interesting finding is that some rules that help maintain safety to some extent may threaten sense of familiarity and ownership. In other words, the courtyard is programmed in a way that maintaining safety and personalizing environments or carrying familiar activities like gardening cannot coexist. Obviously, the organization picks the former. That is to say, residents’ best interest — a balance between safety and freedom—does not quite match an organization’s needs. To reducing potential risks of falling and avoiding litigation, “overprotection” or a staff-controlled environment seems to be an acceptable solution.

Table 7-8. Grouping and evaluating the rules of Silver Life

Experiential attributes	Sub-theme/code of rules (# of rules)	# of rules related to the attribute	# of positive (+) or negative (-) rules to the attribute	Summary	
				+	-
Privacy	Little control of information/ Levels of visibility (2)	2	+1	-1	
	Little control of information/ Flow of personal information (2)	2	0	-2	+2 -3
	Unobtrusive surveillance/ Observation from indoor spaces (1)	1	+1	0	
Social interaction	Unobtrusive surveillance/ Passersby's greeting (3)	3	+3		
	Extension of indoor space/ Accommodation of activities (5)	5	+5		
	People out there/ Spontaneous socialization (8)	8	+8	-0	+23 -0
	People out there/ Control of interactions (3)	3	+3		
	People out there/ Passing time (1)	1	+1		
	People out there/ Less restriction (3)	3	+3		
Accessible space and built features	Things may get easy/ Free use of furniture and accessories (6)	6	+5	-1	+8 -4
	Things may get easy/ Free access (6)	6	+3	-3	
Sensory stimulation	People out there/ Passing time (1)	1	+1	-0	
	Balancing sensory experience/ Vision, touch and hearing (5)	5	+3	-3	
	Balancing sensory experience/ Smell and taste (5)	5	+5	-0	+15 -4
	Balancing sensory experience/ Weather adjustment (7)	7	+6	-1	
Safety and security	Staff as providers vs. residents as receivers/service delivery (10)	7	+5	-2	+23 -5

	Staff as providers vs. residents as receivers/passive activity (1)	1	+1			
	Extension of indoor space/ accommodation of activities (5)	2	+2			
	Unobtrusive surveillance/ Observation from indoor spaces (1)	1	+1	-0		
	Unobtrusive surveillance/ Courtyard as a shortcut (3)	2	+2			
	Unobtrusive surveillance/ Passersby's greeting (3)	3	+3			
	Things may get easy/ Free access (6)	6	+3	-3		
	People out there/ Spontaneous socialization (8)	3	+3			
	Discontinuation of past habits/familiar and active activities (4)	1	+1	-0		
	Balancing sensory experience/ Smell and taste (5)	1	+1			
	Balancing sensory experience/ Weather adjustment (7)	1	+1			
Familiarity	Discontinuation of past habits/familiar and active activities (4)	4	+3	-1		
	People out there/spontaneous socialization (8)	5	+5			
	Balancing sensory experience/ Vision, touch and hearing (5)	3	+3	-0	+18	-1
	Balancing sensory experience/ Smell and taste (5)	4	+4			
	What's new/Exploring things (3)	3	+3			
Awareness and orientation	Little control of information/ the extent of information awareness (10)	10	+6	-4		
	What's new/ Exploring things (3)	3	+3		+13	-4
	What's new/ Knowing what	4	+4	-0		

	happened (4)					
	Staff as providers vs. residents as receivers/maintenance (3)	3		-3		
Sense of ownership	Staff as providers vs. residents as receivers/passive activity (1)	1	+0	-1	+0	-6
	Discontinuation of past habits /a not-so-ideal courtyard (2)	2		-2		
	Staff as providers vs. residents as receivers/maintenance (3)	3	+1	-2		
Participation in meaningful activity	Extension of indoor space/ A place of care or activity programs (2)	2	+2	-0	+6	-3
	Discontinuation of past habits /familiar and active activities (4)	4	+3	-1		

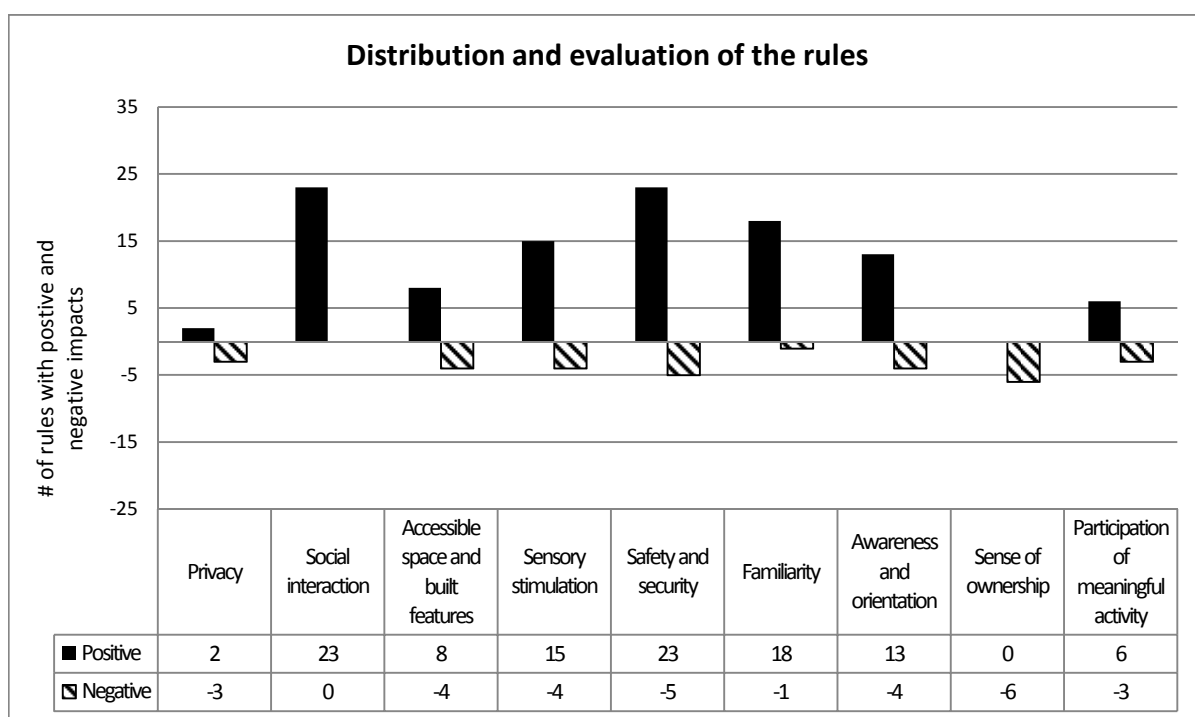


Figure 7-5. Grouping and evaluating the rules of Silver Life

II. Internal Rule of Golden Age's Courtyard

A. General patterns of courtyard uses

Six-day behavior observation was conducted In June, 2013 at Golden Age. It took a total of 41 hours and generated data of 219 person-times of courtyard users. The majority of courtyard visitors were residents (81.7%, 179 person-times), followed by family members and staff (Table 7-9). On average, there were 4.47 person-times of resident users per hour. One staff member showed up in the courtyard every 2.27 hours and one family member every 1.95 hours. Over 78 percent of the resident visitors were wheelchaired. The rest of them were either ambulatory or using a walker. The courtyard was dominated by male residents; they were more mobile and independent (Table 7-10). Most of the residents visited the courtyard alone. It's not common to see family-led or staff-led groups and resident-led groups were never observed (Table 7-11).

Table 7-9. Person-times of courtyard users in Golden Age

	Resident	Family	Staff	Total
Person-times	179 (81.7%)	21 (9.6%)	19 (8.7%)	219

Table 7-10. Gender and mobility of resident users in the courtyard at Golden Age

	Male			Female		
	146 (81.56%)			33 (18.44%)		
	Ambulatory	walker	Wheelchair	Ambulatory	walker	Wheelchair
Person-times	18 (12.33%)	13 (8.90%)	115 (78.77%)	0	7 (21.21%)	26 (78.79%)
Mobility of overall resident visitors						
	Ambulatory		Walker	Wheelchair		
Person-times	18 (10.06%)		20 (11.17%)	141 (78.77%)		

Table 7-11. Outdoor residents by group types in the courtyard of Golden Age

Group types					
	Individual residents	Residents in groups			Total
		Family-led	Staff-led	Resident-led	
Person-times	117 (65.36%)	14 (7.82%)	48 (26.82%)	0 (0%)	179

The six-day data collection includes four weekdays and one weekend. Individual residents dominated the courtyard each day. Peak time is on Sunday and off-peak on Saturday during the observation period. The courtyard had more group users on weekdays; no or few family-led or staff-led groups was observed on the weekend (Table 7-12) (Figure 7-6). A small amount of people started using the courtyard after breakfast (7:30 to 8: 30am). Peak hours begin one hour before and after lunch time (12 to 1: 00 pm) (Table 7-13). Residents went back to their room or dining room around 4:30 pm.

Activities in the courtyard were very passive and disengaged (Table 7-14) (Figure 7-7). Over 20 percent of behavioral incidents were “taking a nap”. Other dominant behavior includes observing nature/ people, talking and smoking. The courtyard is smoking-friendly; there was one person smoking every 1.5 hours, which may explain the heavy cigarette smell in the courtyard (see Chapter 5). One or two residents weeded or fed wild birds with bread but not often. The courtyard was treated as extension of the dining/ activity room; approximately 20.5 percent of the observed activities were structured events like exercise, playing a game and staff-led or family-led reality reminiscence.

Table 7-12. Group types by days in Golden Age

		Days						Total
		Monday June 17	Tuesday June 18	Wednesday June 19	Thursday June 20	Saturday June 22	Sunday June 23	
Person-times	Individual	15	24	19	21	12	26	117
	Family-led	2	4	0	5	0	3	14
	Staff-led	15	0	13	19	0	1	48
	Resident-led	0	0	0	0	0	0	0
Total		32	28	32	45	12	30	179

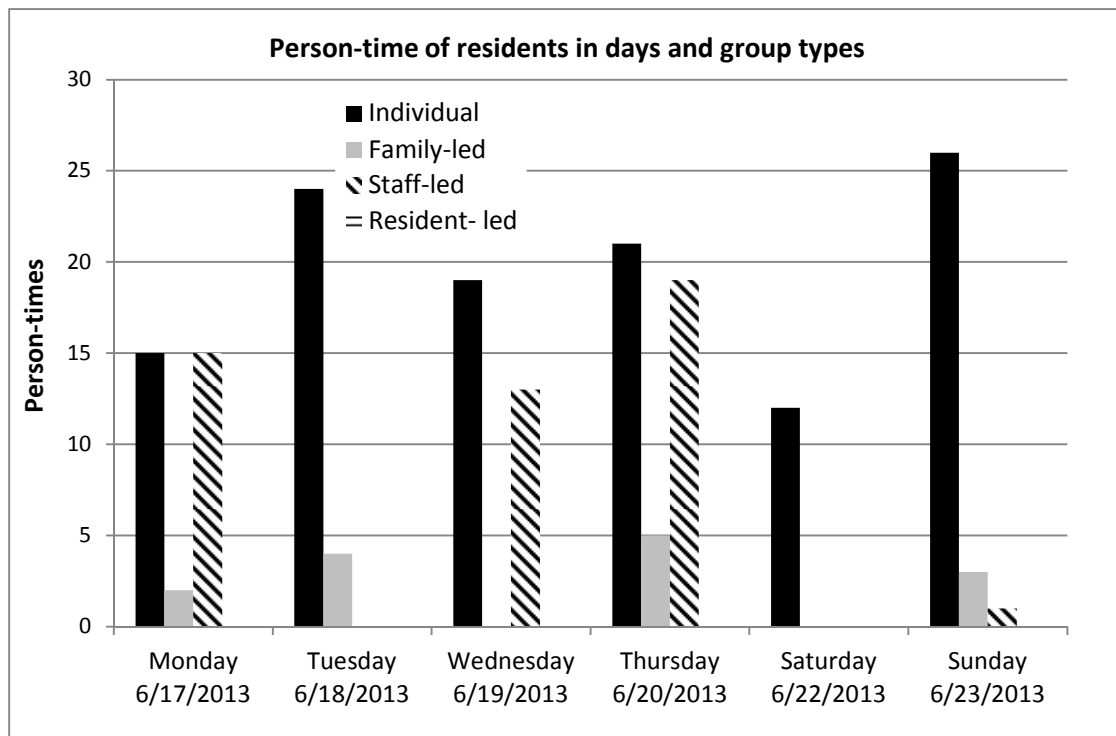


Figure 7-6. Group types by days in Golden Age

Table 7-13. Total person-times of courtyard users by time in Golden Age

		Time								Total
		9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	
Person-times	resident	7	21	38	17	34	24	17	21	179
	family	1	3	1	0	5	10	0	1	21
	staff	0	1	6	4	4	1	0	3	19
Total		8	25	45	21	43	35	17	25	219

Table 7-14. Types of activity in the courtyard of Golden Age

	Activity	Person-times	Percent
1	Gardening	9	3.2%
2	Arranging furniture	1	.4%
3	Throwing bread/feeding Birds	2	.7%
4	Moving Between Shade & Sun	11	3.9%
5	Spontaneous talking	27	9.5%
6	(Individual) Drinking/eating	2	.7%
7	Observing nature/people	41	14.49%
8	Group talking	31	11.0%
9	Exercise	21	7.4%
10	Playing game	7	2.5%
11	Taking a nap	59	20.8%
12	Reading/Watching video	6	2.1%
13	Passing through	6	2.1%
14	Reality orientation/Reminiscence activity	30	10.6%
15	Smoking	28	9.9%
16	Wandering/Walking	1	.4%
17	Taking medicine/water from staff	1	.4%
	Total	283	100.0%

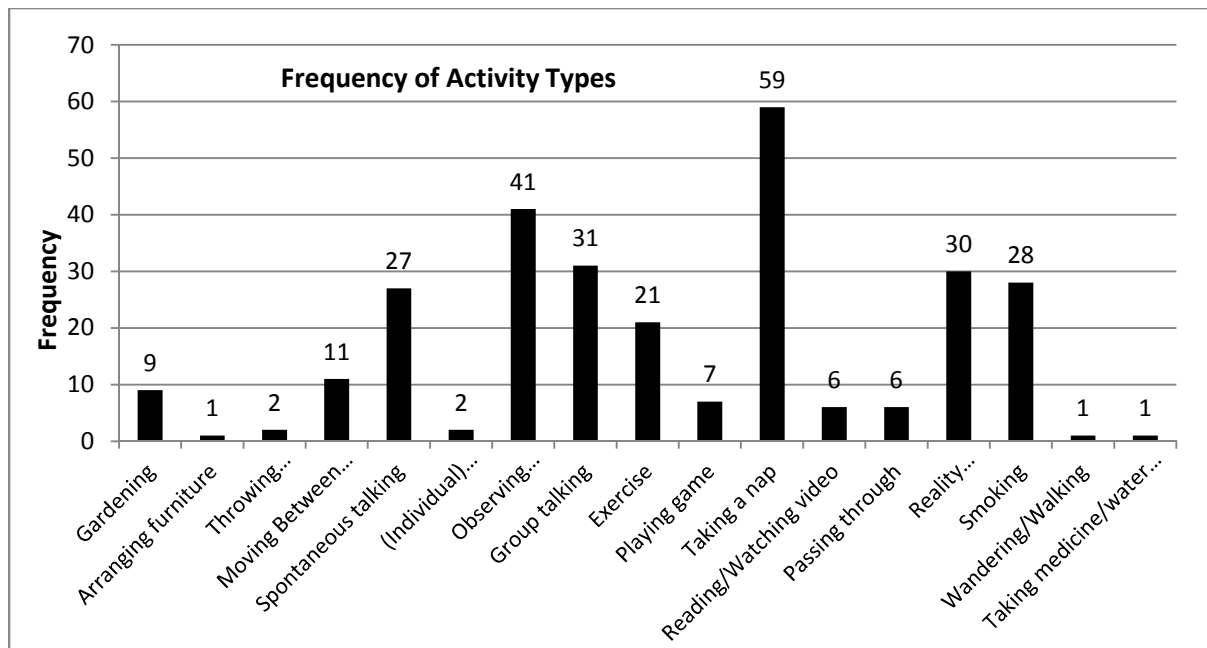


Figure 7-7. Types of activity and their frequency in the courtyard of Golden Age

B. Pattern of rules

A total of 117 different rules were found. Rules with similar goals were grouped and formed 25 coded segments (Appendix O). Nine sub-themes emerged from the codes including 1) not a necessary care component, 2) little control of information, 3) unobtrusive surveillance, 4) things get easy and difficult, 5) familiar faces, 6) few choices of sensory stimulation, 7) meaningful and familiar engagement, 8) safety concerns, and 9) showing some personalities (Table 7-15). Each sub-theme is viewed as a component consisting of multi-level structure.

Table 7-15. Sub-themes of rules observed in Golden Age

Sub-theme	Coded segments	# of rules
1 Not a necessary care component	<ul style="list-style-type: none"> ▪ Undefined responsibility of maintenance ▪ Sporadic care service ▪ Scheduled activity programs ▪ Passive activity ▪ Marketing 	18
2 Little control of information	<ul style="list-style-type: none"> ▪ Levels of visibility ▪ Flow of personal information ▪ Information awareness 	18
3 Unobtrusive surveillance	<ul style="list-style-type: none"> ▪ Observation from indoor spaces ▪ Courtyard as a shortcut ▪ A quick stop ▪ Resident's help 	8
4 Things get easy and difficult	<ul style="list-style-type: none"> ▪ A lack of furniture & shaded patio ▪ Free use of furniture and accessories ▪ Free and easy access to the courtyard 	18
5 Familiar faces	<ul style="list-style-type: none"> ▪ Spontaneous socialization ▪ Control of interactions ▪ Less restriction 	15
6 Few choices of sensory stimulation	<ul style="list-style-type: none"> ▪ Vision, touch and hearing ▪ Smell and taste ▪ Weather adjustment 	19
7 Meaningful and familiar engagement	<ul style="list-style-type: none"> ▪ Meaningful participation ▪ Familiar activities 	9
8 Safety concerns	<ul style="list-style-type: none"> ▪ Behavior conflict ▪ Neglect ▪ Physical hazards 	6
9 Showing some personalities	<ul style="list-style-type: none"> ▪ Being on my way 	6

1. The nine categories of implicit rules

1) Not a necessary care component

This sub-theme includes 18 rules describing that the courtyard was treated as an unnecessary addition. Behavioral evidence suggests that little organizational attention was given to the space. For example, responsibility of the courtyard was not specified; the activity director assumed her responsibility is similar with what the previous director was asked for. She took care of flowers, outdoor decoration, and fundraising. Maintenance staff took care of built components, mow the lawn and trim trees based on the administrator's request; however, the facility had no budget to maintain the courtyard. Several cracks on patios remained there. The courtyard was not clean up on a regular basis; piles of dead weeds, trash, and gloves were left at the courtyard.

Example:

Undefined responsibility of maintenance	GA.2.	No one clean up the courtyard. Piles of dead weeds, trash, and gloves are left at the courtyard for a long time.
Sporadic care service	GA.4.	Few nursing staff bring residents medicine and water to the courtyard.
	GA.6.	Staff check residents in the courtyard occasionally. They offer residents water, radio or assistance in transportation.
Scheduled activity programs	GA.14.	The courtyard is used for structured activities that are compatible with both indoor and outdoor space. It is staff's call to decide where an activity is carried out.
	GA.15.	No specific activity is planned to take advantage of natural resource in the courtyard.
Passive activity	GA.16.	Most of residents in the courtyard are either talking to others or observing nature/people.
	GA.17.	Few residents are allowed to do light gardening with the activity director's approval.
Marketing	GA.18.	The courtyard is introduced in visitors' tours. Led by the administrator; tour groups just look at the courtyard from the dining room without walking around the space

Staff are required to check the courtyard regularly but the request was not translated into practice very well. Residents sometime sat outside for more than three hours in summer, and no staff asked them if they need water or want to move inside. Residents were expected to engage in passive activities. From staff's perspective, passivity may maximize safety in environments that lacks of

maintenance. The courtyard is adjacent to the dining room/ activity room. It was treated as another activity space. When the weather was permitting, activity staff led an outdoor group activity every two days. The structured outdoor activities are compatible with indoor settings so it is staff's call to decide where to exercise or play. No specific activity was planned using existing natural resource in the courtyard.

The courtyard was introduced in visitors' tours. Led by the administrator, tour groups usually looked at the courtyard from the dining room instead of walking around the space.

2) Little control of information

This sub-theme includes 18 rules related to level of visibility, control of personal information and information awareness in the courtyard. In the morning, people usually sat at the shady edge of the central patio where they could see indoor activities at the dining room. However, the spot is too close to a bedroom window; residents at the room may feel a lack of privacy, and people at the courtyard may feel being observed. No screened or semi-enclosed seats were provided in the courtyard. When all patio space was exposed to sun around noon, people stayed on a path, a rectangular space fully shaded by an oak tree in the afternoon. The path connects the central and side patio and is located out of staff's sight. To avoid being neglected, residents stay at the join of the central patio and path where they can see and being seen by indoor staff.

Conversation between people on the central patio can be easily overheard. An interview with a resident was conducted at the patio; personal information of the interviewee was exposed. The side patio may be a better spot for such event; it is off the mainstream traffic and has less visibility. However, the side patio is only shaded in the morning and is too close to a bedroom window.

Residents used the dining room as a sun room to observe the courtyard and receive outdoor information; they previewed the courtyard before taking an outdoor trip. No public space at the inner ring of corridors has windows facing at the courtyard. Residents were unable to get outdoor information

while walking on a hallway, and courtyard users had no chance to catch rhythms of indoor routines. The courtyard may confuse residents in a way that no clear cues guided behavior. A clock is absent, and no staff reminded residents of mealtime or coming activities. No sign indicated open/close of the courtyard. Besides, undefined sections caused behavior conflict; no physical cue differentiates paths and sitting areas.

Example:

Levels of visibility	GA.20.	Family groups like to stay at the shady edge of the central patio in the afternoon; the space connecting two entries allows people to contact with indoor environments but makes them not being free from public observation.
	GA.21.	No screened or semi-enclosed seats are provided in the courtyard.
Flow of personal information	GA.23.	Conversation at the central patio can be easily overheard. People often talk about personal matters and family members' condition.
	GA.24.	Staff are allowed to conduct interviews with residents in the courtyard. However, information is likely to be exposed to public.
Information awareness	GA.25.	Residents like to sit at the edge of the patio where they can overview the courtyard.
	GA.26.	Residents use the dining room as a sun room so they preview the courtyard before take a further venture.
	GA.31.	No clear physical cue differentiates paths and sitting areas. People gather at wherever they like.
	GA.34.	No sign indicates open/close of the courtyard.

3) Unobtrusive surveillance

The sub-theme contains eight rules related to surveillance resources. The courtyard was monitored indirectly. For example, the courtyard is visible from the main dining room/ activity room and secondary dining room; it is also partially visible from the activity staff office; activity staff were able to check the courtyard while carrying out tasks. The issue was just how seriously the surveillance was carried out by staff. Besides, few staff used the courtyard as a shortcut between corridors; they helped watch residents in the courtyard. Staff are allowed to smoke in the courtyard. Some staff smokers chatted with residents and helped push residents back to their rooms. Furthermore, residents helped each other; people who are more independent watched other residents in the courtyard.

Example:

Observation from indoor spaces	GA.37.	Activity staff can easily monitor the courtyard from the main dining room/activity room and secondary dining room.
A quick stop	GA.41.	Most of staff left quickly after bringing residents to the courtyard. They didn't interact with other residents or check their needs.
	GA.43.	Some nursing staff smoke in the courtyard; they talk to residents or bring residents back to the building.
Resident's help	GA.44.	Residents help each other; some residents check if other people need assistance.

4) Things may get easy and difficult

The sub-theme includes 18 rules describing issues in accommodating outdoor activities. The courtyard was poorly furnished. Movable plastic chairs were major furniture accommodating spontaneous and structured activities. There is only one round metal mesh table (42" wide), in the courtyard; it is heavy and hardly moved; no movable coffee table was provided to put food and drinks. One family member had to hold a device to show picture and video to a resident all the time during their meeting. The plastic chairs and ash tray stands are movable; people dragged them to wherever they like. No water dispenser was placed in the courtyard, and no shade device sustained a longer outdoor stay. Shade was inadequate in the courtyard; people competed for tree shade. When staff were going to have a group activity on the path under the tree shade, individual residents were asked to leave; activity participants were lined on the path for a group activity. When a resident at the bottom of the raw liked to go inside, staff spent a lot of effort to create a walkway by moving other residents aside.

Residents had free access to the courtyard during the day. The two doors (one wheelchair power door and one sliding door) were kept unlocked. However, there were still several accessibility issues in the courtyard. For example, although the wheelchair power door allowed residents to access the courtyard independently, wheelchaired residents had troubles to reach wheelchair touch bottom. Besides, a threshold at the sliding door constantly blocked movement; staff had to lift wheelchairs when

transporting residents from the dining room to the courtyard. Pavement cracks were obstacles to free movement, and ground-level gardens required residents to bend their body to weed.

Example:

A lack of furniture & shaded patio	GA.46.	There is no small and movable table to place food, drinks and recreational device.
	GA.48.	The central patio is exposed to sun after 9:30 am. There is no shade device so a structured activity is usually carried out on the path or the side patio under the tree shade. Residents are lined along the path or patio. When a resident at the bottom of the raw liked to go inside, it took a lot of effort to create a walkway by moving other residents aside.
Free use of furniture and accessories	GA.50.	People dragged plastic chairs and ash tray stands to wherever they like in the courtyard. Some ambulatory residents dragged chairs on the lawn under the tree shade.
	GA.52.	Residents used water hoses to water plants with staff's approval and help.
Free and easy access	GA.58.	The glass-panel sliding door to the courtyard is heavy even staff have troubles to push it.
	GA.61.	There is no raised bed in the courtyard so residents bend their body to get rid of weeds.

5) *Familiar faces*

The sub-theme contains 15 rules regarding people's interaction in the courtyard. Some residents visited the courtyard every day. They came to the courtyard spontaneously and observed nature, smoked, napped and talked to others. Some random conversations between residents were found but not very often. Some family members escorted residents to the courtyard; they may exercise, play games and watch pictures or listen to music together. Family members who liked to have more privacy may sit at the side patio or the path. Staff who smoke in the courtyard interacted with residents; they chatted or laughed with residents for a short period of time. Few residents started small talks with others; they formed a two-person social group under the tree shade; however, the gathering usually lasted short.

Behavior in the courtyard was not strictly regulated. Residents threw cigarette butts on the ground. They saved crusts of bread to feed wild birds. Although there was no raised bed or gardening tool in the courtyard, residents bended their body to do weeding with bared-hands whenever they felt

necessary. In an outdoor group activity, family members may sit next to residents in outdoor group activities. Residents could join the game anytime but may not withdraw the game halfway; staff preferred all residents leave the courtyard together.

Example:

Spontaneous socialization	GA.64.	Spontaneous conversations between individual residents are found but not very often.
	GA.65.	More family groups visit the courtyard in the afternoon. Family members are not interacting with other residents.
Control interactions	GA.68.	Two to three residents propel themselves to other people for conversation.
	GA.69.	Family members who like to have more privacy may gather at the side patio or the path.
Less restriction	GA.72.	Residents throw cigarette butts on the ground.
	GA.73.	Family members may participate in a structured activity. Residents may join the game anytime but may not withdraw half way through the game.
	GA.74.	Residents may throw bread to the ground for birds. No staff intervenes or wipe it away.

6) Few choices of sensory stimulation

The sub-theme consists of 15 rules regarding people's sensory experience in the courtyard. Most activities in the courtyard triggered visual-based sensory experience. Although residents were allowed to do light gardening characterized by touch experience, the gardens were not wheelchair accessible so only one or two people could overcome physical obstacle and enjoy the activity. Some residents walked in the courtyard; different senses of pressure may be triggered when they step on hard pavement and grassland.

In terms of olfactory experience, the courtyard had strong cigarette smell; it covered up fragrance of flowers and repelled non-smokers. Water spray on a pond produces noise but it was constantly turned off due to some maintenance issues. When there was a vegetable garden donated by staff or family members, residents were allowed to taste garden-grown food in their meal.

During the observation period, residents were very sensitive to the weather. They moved or changed their position to keep thermal comfort. Shady areas were inadequate in the courtyard; the whole space relied on an oak tree to cool the environments down. A staff-led activity had priority for the shade.

Example:

Vision, touch & motion	GA.78.	Flowers are taken care of to maximize visual appreciation.
	GA.80.	Residents are allowed to do light gardening such as watering, weeding and deadheading.
	GA.81.	Family members and residents take a walk in the courtyard.
Smell, taste and auditory	GA.83.	Heavy cigarette smell may repel non-smokers.
	GA.87.	If there is a vegetable garden donated by staff or family members, activity staff will take cares of them and residents are allowed to taste garden-grown food in their meal.
	GA.88.	No background music plays in the courtyard. Traffic and mechanic noise is loud enough to get attention.
Weather adjustment	GA.89.	Shady areas are inadequate. The courtyard relies on an oak tree to cool environments. After 10:30 there is little building shade. A structured activity is usually carried out on the path or the side patio under the tree shade in the morning. Some areas of the central patio are covered by the tree shade after 2:00pm.
	GA.91.	Family members sit under the tree shade no matter where it is.
	GA.95.	Residents move with changes of shade or sun.

7) *Meaningful and familiar engagement*

The sub-theme includes nine rules describing participation in meaningful and familiar activities. Residents' sense of usefulness or social identities may be enhanced in the courtyard. Staff encouraged residents to volunteer in setting up environments or leading activities. Some residents volunteered to water plants, and staff pulled out hoses for them. Few residents just did weeding when they feel necessary; staff sometimes came out to stop them due to safety concerns. According to the staff, these residents used to have home gardens or work in green houses; they were great helpers in maintaining garden space. Self-help among residents was found in the courtyard because no staff was around to respond to residents' need. For example, a wheelchaired resident pushed others to overcome pavement cracks to get into the building; however, such assistance may put them at risk.

Residents carried some familiar activities freely in the courtyard. They saved left-over bread to feed wild birds, and no staff wiped it away. Residents smoked in the courtyard or enjoy a cup of free coffee or juice. Family members and residents played games or did exercise on the lawn; no staff stopped them from enjoying the activities.

Example:

Meaningful participation	GA.97.	Residents are allowed to volunteer in setting up activity environments or leading activities.
	GA.98.	Some residents help maintaining garden space. A past social role such as a green thumb and greenhouse worker may be enhanced.
Familiar activities	GA.101.	Residents are allowed to save left-over bread to feed wild birds.
	GA.102.	Residents talk about flowers and vegetables in the courtyard, and they start reminiscence of life in farms and home gardens.
	GA.105	Family members and residents play a game or do exercise in the courtyard.

8) Safety concerns

The sub-theme includes 13 rules describing behavior conflict, staff neglect and physical hazards. Behavior conflict emerges as people compete for shade. In the courtyard, path connecting the two patios was the only shady area in the morning. To avoid sun, residents stay in the entrance of the path due to safety concerns and better control of environments. For example, entrance of the path is where shade meets sun so residents were able to adjust thermal comfort accordingly. Second, the spot is visible from the dining room/ activity room; people can seek help easily. Third, people at the spot are able to preview the whole patio effortlessly; they could quickly catch on-going activities. When the entry of the path was occupied, other residents who also looked for shady spots either returned to the building or bypassed the blocker by walking on grass. To avoid the sun, staff led group activities on the path. Seven or eight residents were arranged in one row on the path. When people who stayed at the bottom of the row want to withdraw from the activity, they were usually asked to stay because staff had to either move the line to create a path or push residents on a wheelchair on grass (or let them walk on grass). Either way delayed the activity and took staff effort in transportation.

Another risk was related to physical hazard; cigarette butts were randomly threw on the ground. They made the courtyard look filthy and could cause a fire. Plastic chairs were not sturdy and caused fall during the observation period. Staff's neglect may worsen an already-unsecured environment. They did not check outdoor residents regularly; residents may stay at the courtyard over two or three hours without water or a hat in summer. When residents asked for help, no staff was around or aware of their request. The neglect practice also includes poor maintenance; wheelchairs were stuck at cracks that have existed for a long time.

Example:

Behavior conflict	GA.107.	Residents who stay on the path for tree shade block the way to the side patio. If there will be a group activity in the morning, the "blockers" are asked to leave.
	GA.108.	Residents are lined at the path for a group activity. If residents who sit at the bottom of the row like to withdraw from the activity, they are usually asked to stay because staff had to either move the line to create pass space or push the withdrew residents on grass (or let them walk on grass). Either way delayed the activity and took more staff effort in transportation.
Neglect	GA.110.	No staff check residents who stay at the courtyard over two or three hours in summer.
	GA.113.	Maintenance staff are aware of the cracks of pavement but take no action in improving environments due to budget shortage.
Physical hazards	GA.115.	Residents are easily stuck at the cracks in front of the power door.
	GA.117	Cigarette butts are randomly thrown on the ground, which could start fire easily.

9) Showing some personalities

The sub-theme consists of nine rules regarding personalization of environments. Residents had some control of the environments; they were allowed to place their own chair in the courtyard, throw bread to feed wild birds or do weeding spontaneously. These activities, although ordinary, suggest that residents had chances to personalize their surrounding or follow their life principles. For example, saving leftover bread may imply a lifestyle of not wasting food. By feeding birds, one may not violate a "cleaning your plate" ethic. Weeding could be an action of realizing one's aesthetic principles; residents could shape gardens to their ideal status by getting rid of rampant weeds. Residents did not always get their way. They were not encouraged to decorate the courtyard or ornament windows. It was not easy

to withdraw from outdoor activity easily; staff preferred consistent behavior among residents in terms of coming and leaving. Resident's preference of thermal-comfort levels was not inquired; staff positioned them in the sun or shade based on their own judgements.

Example:

Being on my way	GA.119.	Residents were not encouraged to decorate the courtyard or ornament windows by adding flowers baskets or birdhouses.
	GA.120.	Residents are allowed to throw leftover bread to the ground or do weeding spontaneously.
	GA.122.	Residents may not withdraw from outdoor activities easily; staff preferred consistent behavior among residents in terms of coming and leaving.
	GA.123.	Resident's preference of thermal-comfort levels was not inquired; staff positioned them in the sun or shade based on their own judgement.

2. Pattern: a men's street corner

The nine subthemes form a system centering three topics "Things may get easy and difficult", "Safety concerns" and "Not a necessary care component" (Figure 7-8), which creates an "a men's street corner"- like setting. It is a neighborly and gendered place; it is flexible to accommodate familiar activities but unkempt and unsafe.

Relationships between them reflect issues of interactions between Golden Age's physical environments, staff practice and organizational attitudes. The three topics shape and are shaped by two rule sub-systems: environmental and personal. The former covers the physical and organizational features in governing conducts. Sub-themes like "little control of information" and "unobtrusive surveillance" belong to this category. The latter is concerned with personal expectation in fitting in contextual environments. Sub-themes such as "showing some personalities" and "meaningful and familiar engagement" are in this group.

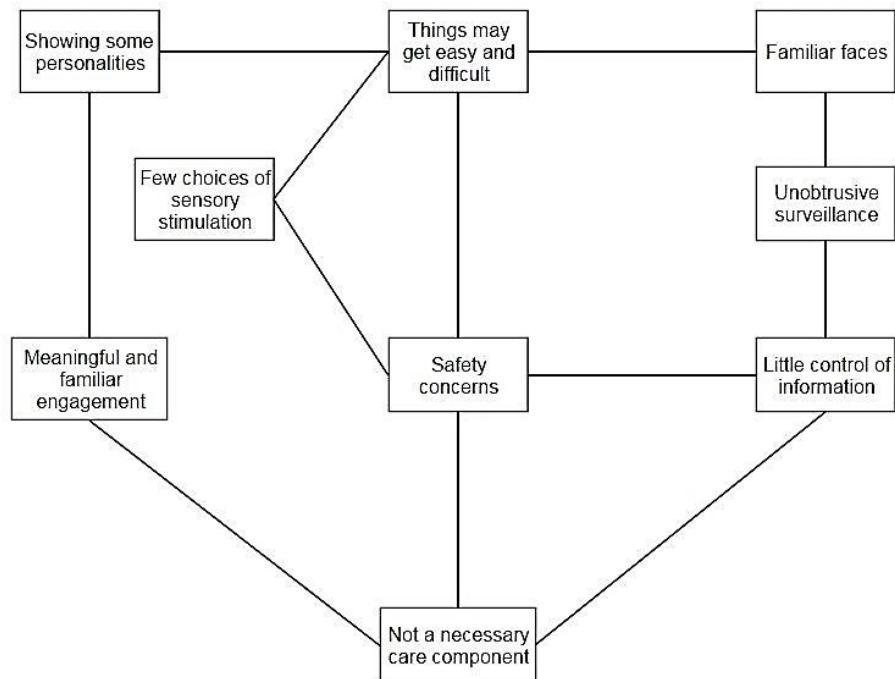


Figure 7-8. Pattern of internal rules in the courtyard of Golden Age

Specifically, safety concerns (sub-theme #8) may be reported for behavior conflict and physical hazards; they include obstacles to access to and navigation in the courtyard and issues of unsafe and inadequate furniture (sub-theme #4: things may get easy and difficult). These hindrances work as environmental press, excluding residents who are less competent. As a result, the courtyard is mainly used by a group of people who are more independent (sub-theme #5: familiar faces). The group may not need regular and direct surveillance (sub-theme #3: unobtrusive surveillance); it was found that residents were not checked by any staff during their two- or three-hour outdoor stay. According to activity staff, some surveillance from indoor space is carried out, and the courtyard is kept very simple and public so staff know what happened at a quick glance (sub-theme #2: little control of information).

However, the simplicity is not equal to legibility; undefined sections induce behavior conflict and put residents at risk (sub-theme #8: safety concerns).

The courtyard is treated as an out-of-care delivery area; no activity staff invites residents at the courtyard to participate in an ongoing indoor activity. Very few nursing staff push residents to the courtyard or bring them back to the building. Very few staff check outdoor residents in person and offer them water, hat, clothes or any other type of assistance. Several reasons may lead to such practice. For example, care protocol may overlook outdoor users or request of supervision is not translated into practice for frontline staff (sub-theme #1: not a necessary care component). Given less staff's attention, residents have some flexibility in carrying out meaningful and familiar activities; they help other residents in overcoming pavement cracks and help staff in maintaining gardens (sub-theme #7: meaningful and familiar engagement). They save bread to feed wild birds or find a comfortable spot to smoke. Some of these activities allow residents to personalize the surroundings in a certain level (sub-theme #9: showing some personalities); for example, they may realize their aesthetic principles through weeding and deadheading. They may bring their own chair and place it on a favorite spot in the courtyard.

Personalization may be facilitated and also impeded by deficiency of physical environments. From staff's perspective, the courtyard is poorly furnished so they welcome people to donate furniture, plants, accessories and other resources. The courtyard is thus personalized in a way that people are able to bring their familiar items that show some of their personalities. On the other hand, when people like to execute their control on gardens (e.g., weeding, watering and deadheading), their attempt is compromised by a lack of raised planting areas and assistive tools. When people sit on their lounge chair and try to enjoy a cup of coffee, there is no table to place drinks and food (sub-theme #4: things may get easy and difficult). A lack of amenities, furniture and tools turns the courtyard into a visual-based outdoor space (sub-theme #6: few choices of sensory stimulation). The most common activity in the

courtyard is observing nature and people, talking and taking a nap. Residents' passive interaction with the courtyard reduces urgency of solving safety concerns (sub-theme #8), which may explain why the courtyard has not been improved for over 10 years.

C. Linkage of the experiential attributes

A total of 117 rules (Appendix O) are grouped under the nine experiential attributes. Each rule is assigned a negative or positive point to indicate its impact on shaping the attributes. Results of evaluation are shown in Table 7-16 and Figure 7-9. "Familiarity" and "Sensory stimulation" stood out. The rest of the attributes are overlooked; they are shaped by few positive but more negative rules. Overall, the courtyard may not be so desirable to nursing home residents since safety is likely to be jeopardized.

One unique feature is that "Sense of ownership" and "Participation in meaningful activity" are enhanced by some rules in maintaining residents' identity, personality and control. Ironically, these rules are formed due to little staff attention on courtyard users. In such a hazardous environment, the more active engagement residents have, the more likely they are exposed to danger. With no attempt of improving the courtyard, the facility seems to create only two choices between risky active engagement and safe passivity, and ask residents to pick up a side.

Table 7-16. Grouping and evaluating the rules of Golden Age

Experiential attributes	Sub-theme/code of rules (# of rules)	# of rules related to the attribute	# of positive (+) or negative (-) rules to the attribute	Summary	
				+	-
Privacy	Little control of information/ Levels of visibility (4)	4	0	-4	
	Little control of information/ Flow of personal information (2)	2	0	-2	+2 -6
	Unobtrusive surveillance/ Observation from indoor space (3)	2	+2	0	
Social interaction	Things may get easy and difficult /a lack of furniture & shaded patio (5)	5	0	-5	+8 -8

	Familiar faces/ Spontaneous socialization (5)	4	+3	-1		
	Familiar faces/ Control of interactions (4)	4	+2	-2		
	Familiar faces/ Less restriction (6)	3	+3	0		
Accessible space and built features	Things may get easy and difficult /a lack of furniture & shaded patio (5)	3	0	-3	+5	-13
	Things may get easy and difficult / Free and easy access (8)	8	+2	-6		
	Things may get easy and difficult / Free use furniture and accessories (5)	5	+3	-2		
	Safety concerns/ neglect (5)	2	0	-2		
Sensory stimulation	Few choices of sensory stimulation/ Vision, touch & motion (5)	5	+5	0	+12	-7
	Few choices of sensory stimulation/ Smell & taste (6)	6	+3	-3		
	Few choices of sensory stimulation/ Weather adjustment (8)	8	+4	-4		
Safety and security	Safety concerns/behavior conflicts (3)	3	0	-3	+1	-18
	Safety concerns/Neglect (5)	5	0	-5		
	Safety concerns/Physical hazards (5)	5	0	-5		
	Unobtrusive surveillance/ Resident's help (1)	1	0	-1		
	Few choices of sensory stimulation/ Weather adjustment (8)	3	0	-3		
	Little control of information/ Information awareness (13)	2	+1	-1		
Familiarity	Meaningful and familiar engagement/ familiar activities (5)	5	+5	0	+15	-2
	Meaningful and familiar engagement/ Meaningful participation (4)	1	0	-1		
	Familiar faces/ Spontaneous socialization (5)	1	+1	0		
	Showing some personalities / Being on my way (6)	2	+2	0		
	Little control of information/ Information awareness (13)	2	+2	0		
	Few choices of sensory stimulation/ Vision, touch & motion (5)	3	+3	+2		
	Few choices of sensory stimulation/	3	+2	-1		

	Smell & taste (6)					
Awareness and orientation	Little control of information/ Information awareness (12)	12	+2	-10	+2	-10
Sense of ownership	Showing some personalities/Being on my way (6)	6	+2	-4		
	Few choices of sensory stimulation/ Vision, touch & motion (5)	2	+2	0		
	Meaningful and familiar engagement/ familiar activities (5)	2	+2	-2	+8	-8
	Things may get easy and difficult / Free use furniture and accessories (5)	2	+2	0		
	Little control of information/ Information awareness (12)	2	0	-2		
Participation in meaningful activity	Meaningful and familiar engagement/ Meaningful participation (4)	4	+3	-1	+3	-1
	Unobtrusive surveillance/ Resident's help (1)	1	+1	0		

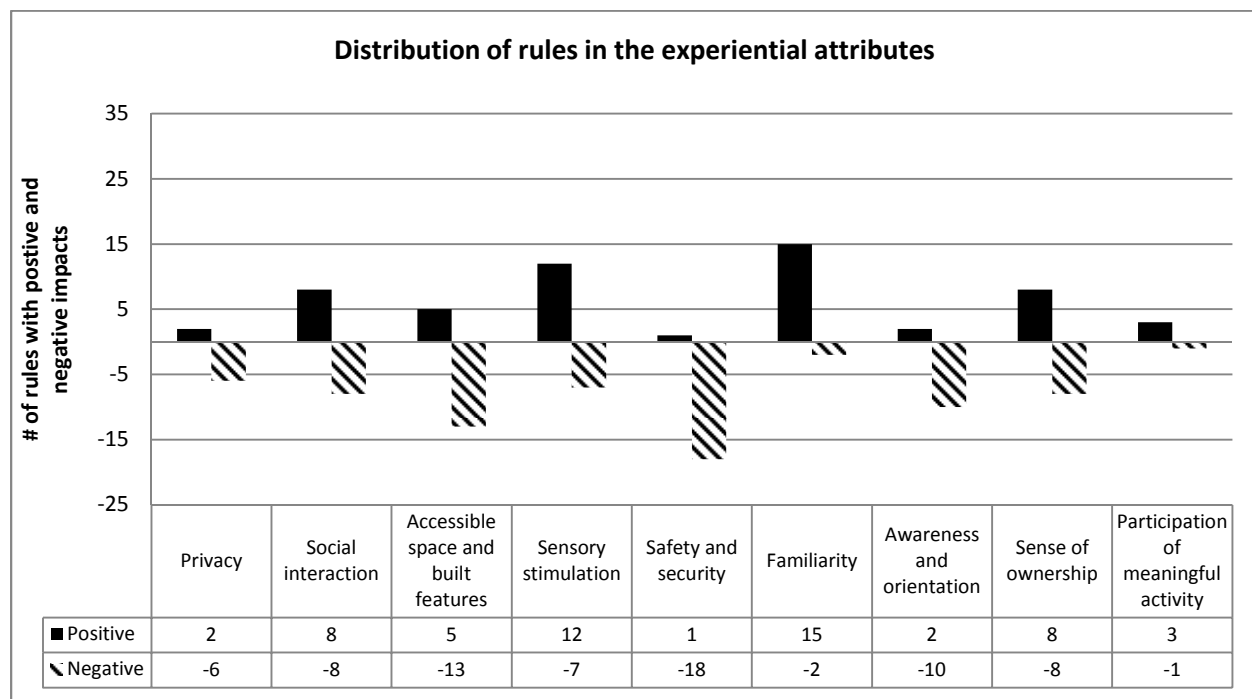


Figure 7-9. Grouping and evaluating the rules of Golden Age

III. The Hidden Rule of Elderly Living's Courtyard

A. General patterns of courtyard uses

A behavior observation was conducted in July 2013 at Elderly Living. It took a total of 11 day and 58.5 hours and generated data of 490 person-times of courtyard users. The majority of courtyard visitors were residents (48.60%, 293 person-times) (Table 7-17). On average, there were five person-times of residents per hour in the courtyard. Most of family members visited the courtyard during weekends. There is one family member visiting the courtyard every 2.7 hours on average. Very few staff were found. There is one staff member showing up in the courtyard every 30.6 hours. The courtyard has approximate equal amount of male and female resident visitors (Table 7-18). One male resident wandered at the courtyard several times a day every day, which increase the frequency of male resident visitors. Almost all resident users were on a wheelchair (98.98%). An automatic door with a wheelchair touch pad facilitates wheelchair access.

Table 7-17. Total person-times of Elderly Living's courtyard users

	Resident	Family	Staff	Total
Person-times	293 (48.6%)	181 (30.0%)	16 (2.7%)	490 (100%)

Table 7-18. Gender and mobility of resident users in Elderly Living

	Male			Female		
	152 (51.88%)			141 (48.12%)		
	Ambulatory	Walker	Wheelchair	Ambulatory	Walker	Wheelchair
Person-times	0	0	152 (100%)	1 (0.71%)	2 (1.42%)	138 (97.87%)
Mobility of overall resident visitors						
	Ambulatory		Walker	Wheelchair		
Person-times	1 (0.34%)		2 (0.68%)	290 (98.98%)		

Over half of the resident visitors went to the courtyard alone. Approximately one third of them were in a family group, and the rest of them were in staff-led or resident-led groups (Table 7-19). Individual residents dominated the courtyard on weekdays (Table 7-20) (Figure 7-10). More family groups appeared on Friday and Saturday during the observation period. There were few staff-led groups. The number of staff-led group peaked on Sunday (July, 14, 2013) because of a ball-tossing activity.

Table 7-19. Outdoor residents by group types of Elderly Living

	Group types				Total
	Individual residents	Residents in groups			
		Family-led	Staff-led	Resident-led	
Person-times	152 (51.88%)	114 (38.91%)	17 (5.80%)	10 (3.41%)	293 (100%)

Table 7-20. Group types by days in Elderly Living

		Days					
		Tuesday July 02	Thursday July 04	Friday July 05*	Sunday July 07	Monday July 08*	Tuesday July 09*
Person-times	Individual	7	26	8	6	5	6
	Family- led	7	12	4	13	1	0
	Staff-led	0	0	1	0	1	0
	Resident- led	0	0	0	6	0	0
Total		14	38	13	25	7	6

* half-day observation because of the rain

		Days					Total
		Wednesday July 10	Thursday July 11	Friday July 12	Saturday July 13	Sunday July 14	
Person-times	Individual	19	32	17	13	13	152
	Family- led	12	13	27	17	8	114
	Staff-led	5	0	0	1	9	17
	Resident- led	0	0	0	4	0	10
Total		36	45	44	35	30	293

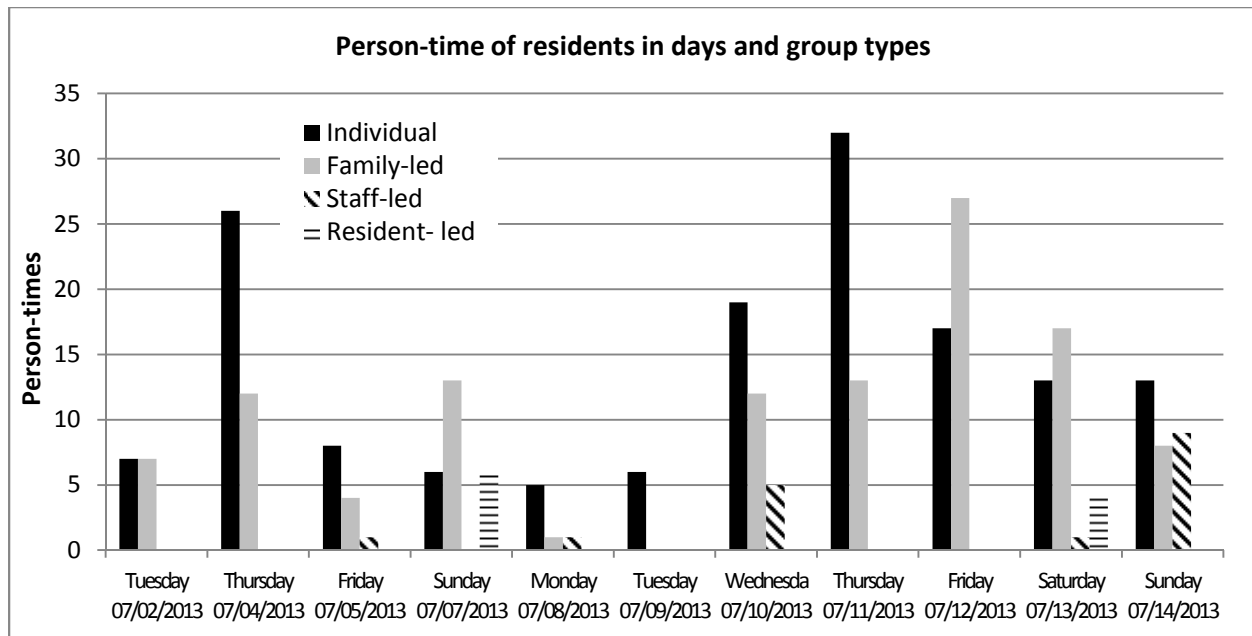


Figure 7-10. Group types by days in Elderly Living

A small amount of people started using the courtyard after breakfast (7:30 to 9:00am). Morning peak hours start from 11 am to noon. Afternoon peak hours begin after lunch (11:45 to 1:00pm) and usually last for two hours. Residents went back to their room or dining room around 4:30 pm (Table 7-21). Activities in the courtyard were very passive. Over 40 percent of behavioral incidents were talking (“group talking” and “spontaneous talking”) (Table 7-22) (Figure 7-11). Other dominant behavior includes “observing nature/people” and “napping”. A relatively higher frequency of “arranging furniture” and “moving between sun and shade” was found. Many people re-arranged furniture to create a social setting or to move chairs to shady spots. When the only one shade structure, a pergola, was occupied, residents sat under crabapple trees and adjusted their position or location to changes of the sun or shade.

Another unique feature is that physical therapists were using the courtyard path for rehab practice or exercise. It usually occurred during peak hours. The social atmosphere may help release

intense pressure of practice and normalize the therapy process. Gardening was sporadic; residents were not encouraged to dig soil, water plants or get rid of weeds.

Table 7-21. Total person-times of courtyard users by time in Elderly Living

		Time										Total
		9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
Person-times	resident	5	23	64	16	50	50	36	42	4	3	293
	family	0	5	40	7	31	34	26	37	1	0	181
	staff	0	0	6	1	0	5	2	0	0	2	16
Total		5	28	110	24	81	89	64	79	5	5	490

Table 7-22. Types of activity in the courtyard of Elderly Living

Activity		Person-times	Percent
1	Gardening	2	.3%
2	Arranging furniture	68	8.9%
3	Organizing/cleaning environments	2	.3%
4	Moving between sun and shade	23	3.0%
5	Playing with a dog	9	1.2%
6	Smoking	3	.4%
7	Taking pictures	3	.4%
8	Playing instrument/singing	7	.9%
9	Group talking	291	38.1%
10	Spontaneous talking	42	5.5%
11	Observing nature/people	111	14.5%
12	Individual walking and observing	29	3.8%
13	(Group) Strolling and observing	14	1.8%
14	(Individual) Drinking/eating	13	1.7%
15	Physical therapy/exercise	28	3.7%
16	Playing game	4	.5%
17	Napping	48	6.3%
18	Reading/watching DVD	15	2.0%
19	Family picnic/cookout	32	4.2%
20	Bird watching	9	1.2%
21	Passing through	8	1.0%
22	Talking to a phone	2	.3%
Total		763	100.0%

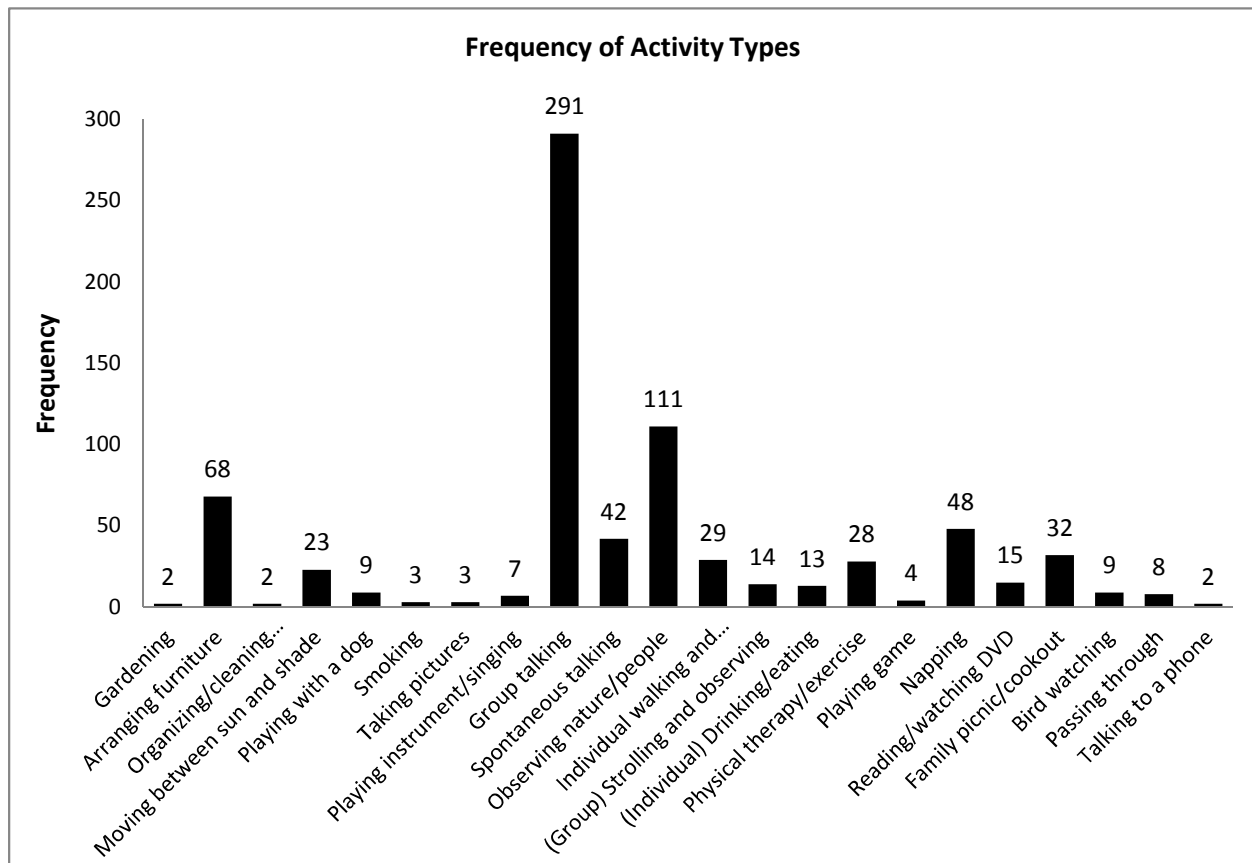


Figure 7-11. Types of activity and their frequency in the courtyard of Elderly Living

B. Pattern of rules

A total of 122 different rules were found. Twenty-five coded segments were formed (Appendix P). Nine sub-themes emerged from the codes including 1) out-of-care delivery area, 2) little control of information, 3) extension of indoor space, 4) limited surveillance resources, 5) things get easy and difficult, 6) people crowding in shay spots, 7) an uninteresting place, 8) safety concerns, and 9) low freedom of choice (Table 7-23). Each sub-theme is viewed as a component consisting of multi-level structure.

Table 7-23. Sub-themes of rules observed in Elderly Living

Sub-theme	Coded segments	# of rules
1 Out-of-care delivery area	<ul style="list-style-type: none"> ▪ Staff-based maintenance ▪ Sporadic care service ▪ Passive activity 	10
2 Little control of information	<ul style="list-style-type: none"> ▪ Levels of visibility ▪ Flow of personal information ▪ Information awareness 	19
3 Extension of indoor space	<ul style="list-style-type: none"> ▪ A place for care/activity programs ▪ Accommodation of activities 	13
4 Limited surveillance resources	<ul style="list-style-type: none"> ▪ Observation from indoor spaces ▪ Being inconvenient to drop by ▪ A quick stop 	8
5 Things get easy and difficult	<ul style="list-style-type: none"> ▪ Free use of furniture and accessories ▪ Free and easy access to the courtyard 	15
6 People crowding in shay spots	<ul style="list-style-type: none"> ▪ Spontaneous socialization ▪ Control of interactions ▪ Less restriction 	14
7 An uninteresting place	<ul style="list-style-type: none"> ▪ Vision, touch and hearing ▪ Smell and taste ▪ Weather adjustment 	22
8 Safety concerns	<ul style="list-style-type: none"> ▪ Behavior conflict ▪ Neglect ▪ Physical hazards 	12
9 Low freedom of choice	<ul style="list-style-type: none"> ▪ Familiar activities ▪ Being on my way 	9

1. The nine categories of implicit rules

1) Out of care-delivery area

This sub-theme includes 10 rules describing little staff's attention on the courtyard. Although responsibility was assigned, work related to the courtyard was not carried out regularly. For example, staff did not clean the courtyard every day; towels, foam cups or lids blown to the ground were left at the courtyard for several days. A small grill that is not allowed in the courtyard was placed under the tree for a long time, and no staff noticed its existence. Besides, care service was not well delivered to the courtyard. Staff did not follow the administrator's request to check outdoor residents every hour. It was often found that when residents needed assistance in movement, no staff was around to push them. One resident who waited staff to push her to the dining room said, "This is a nice place. I like it but now it is 12:20pm. It is supposed that someone will look for me but I guess not. I have to go by myself." Activity staff showed up in the courtyard more often than nursing staff. They checked residents' condition and inquired their needs for hats, water and clothes. However, they stopped by the courtyard spontaneously without a predictable regularity.

Low frequency of staff visits and supervision may help explain why passive outdoor activities were preferred by the organization. Residents were not encouraged to do gardening due to safety concerns. Activities like talking, reading, observing and napping were very common.

Example:

Maintenance	EL.1.	Staff are to clean the courtyard every day. However, it is easy to find towels, foam cups or lids are left on the ground or a mug is left on a table for several days.
Care service	EL.7.	Staff are to bring residents to the dining room if they are late for the meals. Sometimes no staff look for residents at the courtyard after lunch has been served for 15 to 30 minutes.
	EL.8.	Staff are to check residents in the courtyard every hour. However, some residents are left at the courtyard for more than two hours without staff's visit.
Passive activity	EL.10.	Residents are expected to engage in sedative activities. Most of residents in the courtyard are either talking to others or observing nature/people.

2) *Little control of information*

This sub-theme includes 19 rules related to level of visibility, control of personal information and information awareness in the courtyard. The courtyard is very visible. People sitting at the central and entrance patio were not free from being observed by the public. Residents and family members usually stayed at the edge or corners of the patio to avoid public attention. However, residents were unable to prevent personal conversations from being overheard. Although the overall courtyard has 10,147 square feet, activities were limited to three patios: the entrance patio, pergola patio and the central patio. As described in Chapter 5 (Physical Settings of the Three Courtyards), the three patios create only 8.51 square feet per bed for outdoor activities in long term care units. The little control of information was worse in the central patio. It is a major social area where different family groups share limited and unscreened space during peak hours. It was easy to hear people talking about personal matters, family issues and complaint about the facility

Example:

Levels of visibility	EL.12.	People drag chairs and sit at the edge of the entrance patio or corners of the central patio.
	EL.13.	Seats in the pergola are screened by lattice panels with climbing vines.
Flow of personal information	EL.14.	The pergola is located away from the mainstream walkway. Conversation is kept in that semi-enclosed room.
	EL.16.	Conversation at the central patio can be easily overheard. People talk about personal matters, family issues and complaint of the facility.
Information awareness	EL.17.	The entrance patio allows residents to preview the courtyard before taking an outdoor trip.
	EL.21.	Staff are not asking resident's preference of sun and shade before positioning them in the courtyard.
	EL.22.	No clear physical cue differentiates paths and sitting areas in the central patio. Behavior conflict is created between wanderers who pass the patio and family members who sit at the patio.
	EL.27.	Although there is a water dispenser at the courtyard, some residents do not know how to operate the faucet.

The pergola patio provided screened seats. It was located off mainstream walkways, giving a high sense of seclusion. The pergola was usually occupied by a family group at a time. Other people who

wanted to use the space would wait at the other patios for its availability. When all chairs were taken in the courtyard, two different groups may squeeze into the pergola.

Information regarding choice of outdoor activities and availability of outdoor resources was not well communicated. For example, delivery of lunch to the courtyard was not considered in meal service; however, no written and verbal cue conveyed the policy. A clock is absent, and activity staff rarely informed outdoor residents about on-going or coming indoor activities. Staff did not offer choice of sunny and shady spots before positioning residents in the courtyard or inquire residents' preferred schedule of coming back to the building.

3) Extension of indoor space

This sub-theme comprises 13 rules focusing on accommodation of outdoor activities. The courtyard was sometimes treated as extension of indoor space for care. When the weather was permitting, physical therapists led rehab practice in the courtyard. When there was extra help in transporting residents, staff led exercise at the central patio. Residents were arranged in a circle with a staff member at the center. In most of the time the courtyard was viewed as extension of indoor social space. To accommodate structured or spontaneous social activities, the courtyard was furnished with seven mesh chairs, two coffee tables, one metal mesh round table and one plastic chair with metal frames. All furniture can be easily moved or arranged to fit different purposes of social groups except for the round table. Individual residents or family members often dragged a chair and coffee table to a corner for their alone time or two-person gathering. The pergola was furnished with two mesh benches with cushion. Given the shade and comfortable sitting experience, the pergola was constantly occupied.

Example:

A place for care/activity programs	EL.30.	The courtyard is used as a place for rehab practice by therapists.
	EL.31.	The courtyard is set up for structured activities such as ball tossing.
Accommodation of activities	EL.33.	The central patio is furnished with seven movable chairs, one round table and one coffee table to meet needs of different social groups.
	EL.37.	Residents in the central patio stay next to the raised bed so they can put

their drinks on the top of it.

EL.38.	A water dispenser on a cart is usually pushed to the central patio in the morning.
EL.40.	The pergola is usually occupied by a family group with two to three family members and one wheelchaired resident. It seems crowded if two wheelchair users are placed in the pergola at the same time.

4) *Limited surveillance resources*

The sub-theme contains eight rules describing limited surveillance resources of the courtyard. According to the administrator, staff are required to check residents at the courtyard every hour. However, the request was not translated into practice. Residents were sometime left at the courtyard for more than two hours. Since there was no communication device allowing courtyard users to contact indoor staff, residents' needs were sometime delayed and unmet. Unfortunately, the architecture layout worsen the already-neglected environments. First, the courtyard has low visual connection with work space or corridors; staff were less likely to give a quick check while carrying out a task or walking through hallways. Although it is visible from the dining room and kitchen staff may help check outdoor residents, the dining room was not always occupied by staff during the observation period. Second, the courtyard path is not serving as a shortcut between corridors. It is inconvenient for staff to stop by and check residents on their way to work. Most of nursing staff left quickly after bringing residents to the courtyard; there was little interaction with residents or family members in the courtyard.

Example:

Observation from indoor spaces	EL.43.	The courtyard is not visible from corridors and activity offices; staff are less likely to give a quick check while walking through hallways or carrying out a task.
	EL.46.	Residents who stay at the entrance patio can easily get staff attention. The entrance patio is adjacent to the power door which the majority of staff, residents and visitors will use. It is also visible from a nursing station.
Being inconvenient to drop by	EL.47.	Very few staff and family members use the courtyard as a shortcut between corridors.
A quick stop	EL.48.	Most of nursing staff left quickly after bringing residents to the courtyard. They have little interact with other residents or check their needs.

5) *Things may get easy and difficult*

The sub-theme includes 15 rules describing free use of furniture and free access to space. The courtyard was well furnished. Family and residents used the furniture freely; chairs and coffee tables were dragged to wherever people like. To sit under tree shade, family members often moved chairs from the patios to the lawn or walkways. Chairs were arranged into a circle in a group. People put food and drinks on the round table, coffee tables or the raised bed. A coffee table was sometime used as a footstool or a chair. A water dispenser on a cart was placed at the central patio every day to prevent dehydration; foam cups, lids and straw were provided for free use.

Residents had free access to the courtyard during the day. Each of the five doors (one wheelchair power door and four swing doors) was kept unlocked. Although the power door maximized independent outdoor visits, there were several obstacles for movement. For example, the wheelchair touch bottom for the power door was installed on the left side of the door (the left side facing the door). It facilitates left-handed individuals to go inside while right handed wheelchair residents may have to make a U-turn after pushing the bottom. Some residents used the swing doors because they are near where they live. However, residents usually had troubles to pull the door while propelling themselves on a wheelchair. Besides, wheelchairs users were stuck in pavement cracks once in a while, and staff had to spend more efforts in transporting residents. According to the activity staff, maintenance staff was aware of the situation but took no action due to shortage of budget.

Example:

Free use of furniture and accessories	EL.52.	Family members and residents arrange furniture or invent a new function for better social interaction. For example, a coffee table is used as a foot stool or chair.
	EL.54.	A water dispenser is placed at the courtyard every morning. It sits on a cart with clean foam cups, lids and straw. Anyone in the courtyard has free access to it.
Free and easy access	EL.58.	The wheelchair touch bottom for the power door is installed on the left side of the door (the left side facing the door). It facilitates left-handed individuals to go inside while right handed wheelchair residents may have to make a U-turn after pushing the bottom.
	EL.64.	The one-level figure-8 shaped loop allows residents to return to where they start.

6) People crowding in shady spots

The sub-theme contains 14 rules regarding people's interaction in tree shade. The courtyard has only one pergola providing stable shade. Once it was occupied, people competed for tree shade during peak hours. Spontaneous social interaction occurred easily among people who shared shady spots; individual residents formed social group for small talks. Some family members and residents who walked around and looked for shade may greet with other people and start some conversations. Activity staff often initiate conversations when bringing residents to the courtyard. They also checked residents and offered water, sunglasses and clothes. Hot weather sometimes forced people into crowded shady spots and social contact is unavoidable. Some built and landscape features may help ease the situation. For example, the X-shaped raised bed divides the central patio into four different areas. Family members took advantages of that to define their own social space.

A less restrictive social atmosphere was formed in the courtyard. People gathered at wherever they felt comfortable since there was no clear physical cue (e.g., paving pattern) distinguishing paths from gathering space. Some family members talked and laugh loud; other people seemed to feel fine with it. Although a wanderer yelled at toddlers playing in the courtyard, most of users liked to talk and

see kids playing. Family members brought a dog to the courtyard. They also sang and played instruments.

Example:

Spontaneous socialization	EL.68.	Individual residents form a social group at an intersection of two paths.
	EL.71.	Family members greet with other residents while walking on the path to find shady spots and.
Control interactions	EL.73.	Residents propel themselves to other people for conversation.
	EL.74.	The X-shaped raised bed divides the central patio into four different areas. It helps family groups to create their own social space.
Less restriction	EL.77.	Chairs are dragged to where shade is.
	EL.79.	Some family members talk and laugh loud. They play instruments and sing in the pergola.
	EL.80.	Family members bring a dog to the courtyard. Residents play with it.

7) *An uninteresting place*

The sub-theme consists of 14 rules regarding people's sensory experience in the courtyard. The courtyard provided visual-based sensory experience. Flowers on the ground, flower boxes, and raised bed were just for observation. Residents were not encouraged to do light gardening or decoration. Many residents took a stroll on the path and observed nature; a wanderer circled the loop several times a day. No background music played in the courtyard; traffic and mechanic noise was loud enough to get attention. No flowers with fragrance were planted, and no vegetables or herb were grown to trigger taste experience. Overall, sensory experience of the courtyard was monotonous and good for residents who seek to reduce sensory overload.

Residents were very sensitive to heat and coldness. They adjusted their position and orientation to shade or sun. To keep thermal comfort, they sat with one half of their body in the shade and the other half in the sun or sat with their face to the shade and back to the sun. Some people chose to sit in the partial shade under trees. Others came to the courtyard for sun bathing; they usually stayed under the sun for 10 minutes and went inside. Over half of the courtyard was shaded after 5:30pm. Residents

sat through the sunset after dinner. People who are unable to propel themselves usually had troubles to adjust to changes of light and temperature; however, staff was not around when they needed help.

Example:

Vision, touch & motion	EL.82.	Flowers on the ground, flower boxes, and raised bed are just for observation; Residents are not encouraged to do light gardening such as weeding and deadheading. One resident did deadheading quietly.
	EL.83.	Most of residents observe people and nature in the courtyard.
	EL.84.	Family members and residents stroll on the path and check flowers.
Smell, taste and auditory	EL.87.	No flowers with fragrance are planted, and no vegetables or herb are grown to trigger taste experience.
	EL.88.	No background music plays in the courtyard. Traffic and mechanic noise is loud enough to get attention.
	EL.91.	Some residents are allowed to bring a cup of coffee from the kitchen and sit in the courtyard.
Weather adjustment	EL.93.	Shady areas are inadequate. The courtyard mostly relies on crabapple trees to cool environments. However, tree shade is reduced and falls on walkways or lawn areas after 11:00am; people drag chairs to a shady spot no matter where it is.
	EL.99.	Some people come to the courtyard for sun tanning. They stay in the sun for 10 minutes and go inside.
	EL.103.	A structured activity with 10 to 15 persons is usually carried at the central patio. However, the patio is hardly shaded around noon. Some residents withdraw because of the heat.

8) Safety concerns

The sub-theme includes 12 rules describing behavior conflict, staff neglect and physical hazards. Behavior conflict in the courtyard was induced by undefined sections and limited shady areas. Since social space and path areas were not differentiated, group users sometimes blocked entries of the central patio or walkways, confusing a wanderer who circled the courtyard. During the peak hours, people crowded in tree shade of the central patio. Family groups, individual users and wanderer shared limited shady areas. One day, the wanderer yelled at a family group with two toddlers playing in the central patio.

Staff did not check outdoor residents regularly. Some residents were left at the courtyard for more than two hours without water, hat or sun protection. No staff was around or aware of their request when residents need help. In addition, maintenance staff did not clean the courtyard every day or fix pavement cracks. A wanderer was found to drink other's water left on a table.

Example:

Behavior conflict	EL.103.	No clear physical cue distinguishes paths from gathering areas. People sometime stop and gather at path intersections because it feels like a small patio. Behavior conflict is created between people who walk the paths and who stop at the junction.
Neglect	EL.106.	No staff inquire residents' needs regularly in terms of water, hat, clothes and going to the bathroom even if the temperature is over 90°F.
	EL.107.	Staff supposed to place a water dispenser in the morning but sometime it is brought to the courtyard until the early afternoon. No staff check whether the water dispenser is empty during the day.

9) Low freedom of choice

The sub-theme consists of nine rules regarding restriction of familiar activity and display of personalities. Residents were able to carry some of familiar activities such as strolling, birdwatching and nature observation. However, past habits that demand staff's direct supervision or efforts in transportation were not encouraged. For example, residents had few opportunities of gardening, watering and decorating environments. From the administrator's perspective, such active interactions require one-on-one attention; it is not practical with the current staffing resource.

In the courtyard, residents retain little choice of control. For example, staff did not ask resident's preference of sun and shade. They positioned residents based on their own judgments. All decoration of the courtyard is made by staff, and all furniture is provided by the facility. A resident fought for control of environments; he had a different opinion with the administrator regarding orientation of his bird feeder stand. When it was turned to a certain angle by staff, the resident turned it back.

Example:

Familiar activities	EL.112.	A resident's bird feeder is placed by a resident's request and with the administrator's approval. Residents watch bird eating food from the central patio.
---------------------	---------	--

	EL.114.	Family members and residents stroll on the path and observe the surroundings.
	EL.116.	Residents are not encouraged to have outdoor lunch.
Being on my way	EL.117.	A resident has a different opinion with the administrator regarding orientation of a bird feeder stand. When it is turned to a certain direction by staff, the resident will turn it back.
	EL.119.	All decoration of the courtyard is made by staff.

2. *Pattern: a small public green space*

Each of the nine subthemes interrelates with all the others. Their relationships are illustrated in Figure 7-12. The pattern of the relations is characterized by three rule sets: “safety concerns”, “people crowding in shade” and “little control of information”. The triad leads the courtyard into a small “public green space”-like atmosphere. It is social, family-based and safe but lacks intriguing, interactive, affectionate relationships with residents.

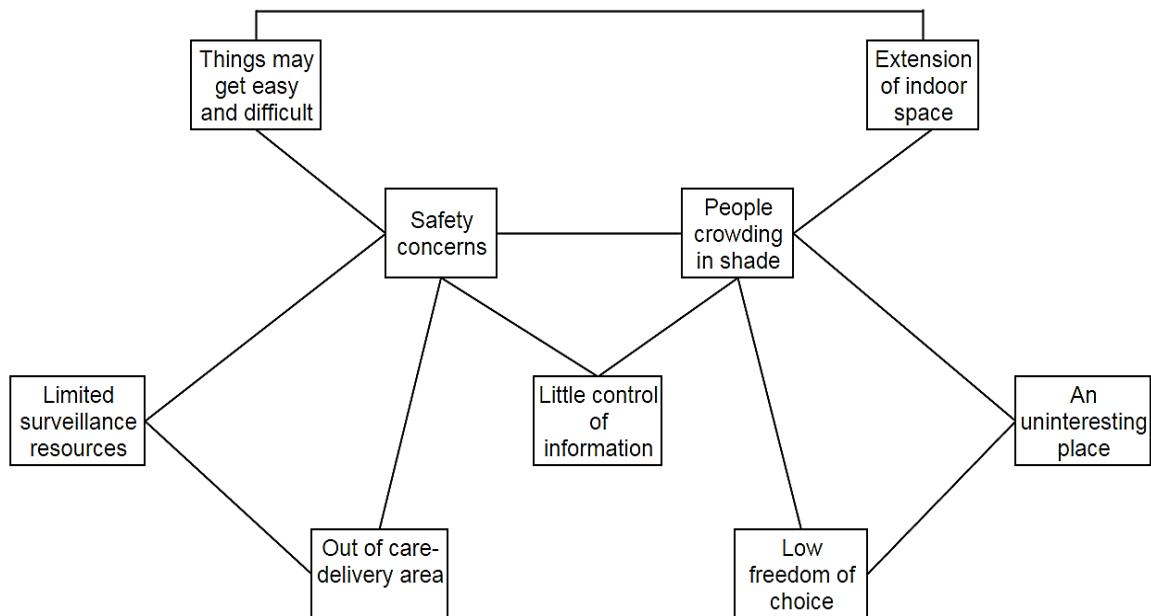


Figure 7-12. Pattern of internal rules of the courtyard at Elderly Living

The structure represents results of interactions between two interdependent clusters: environmental rules and personal rules. The former summarizes restriction of physical and organizational environments; “safety concern” draws other sub-themes together in this cluster. The latter related to personal expectation in fitting environmental rules. The sub-system centers on a set of behavior—“people crowding in shady spots”—which suggests constricted nature of the courtyard. The two sub-systems are directly connected and also intermediated by “little control of information”, suggesting link between two clusters is related to exposure to or provision of information regarding courtyard usage.

“People crowding in shady spots” (sub-theme #6) describes different social groups share limited shade in summer. In shady spots, spontaneous conversations are unavoidable. During peak hours (before and after lunch), tree shade falls short, and personal space is reduce. People are forced to be in the public eye, and their conversations are forced to be public (sub-theme #2: little control of information). When all shady seats are occupied, newcomers just take a walk and return to the building (sub-theme #9: low freedom of choice). Talking, napping and observing people/ nature are the most common activities; active interaction with nature that may trigger touch, taste and olfactory stimulation is not encouraged. (Sub-theme #7: an uninteresting place). Although changes of sun and shade or human clamor may induce some perceptual reaction, the courtyard overall is toneless and uninteresting.

Social interactions are well accommodated; movable chairs, coffee tables and a water dispenser facilitate group gathering (sub-theme #3: extension of indoor space). Different social settings are created by residents and family members, and people gather at wherever they like (sub-theme #5: things may get easy). However, because of undefined social areas, behavior conflict is created between group users and wanderers (sub-theme #8: safety concerns). No physical or text cues guide people to sit, pass and carrying activities on the patios (sub-theme #2: little control of information).

Besides unclear information, there are other obstacles to courtyard usage. Pavement cracks, an inaccessible wheelchair touch bottom and heavy swing doors constantly stop wheelchair movement (sub-theme #5: things may get difficult). Low frequency of staff visits worsens the insecure environments; when residents ask for assistance in movement, no staff is around to provide assistance (sub-theme #1: out of care-delivery area). The neglect may be related to a staff shortage or information lost in translation of request. Furthermore, the courtyard is not quite visible from staff's work space or serving as a shortcut between corridors. A natural surveillance is not formed as it is presented in Silver Life's courtyard.

The constriction of the courtyard may be improved if residents are provided with choice of activities (e.g., passive and active interaction), staff assistance (e.g., a communication device), space (e.g., more shaded and private seats), and sensory stimulation (e.g., tasting garden-grown food). However, information regarding availability of choice is controlled by the organization; it is the administrator's call to decide whether the information should be communicated with residents. For example, gardening is not encouraged in the courtyard but when family members ask for it, the administrator starts to specify the policy of gardening. After evaluating influence on resident safety and environments, the administrator may approve the idea with conditions. Few years ago, a family member grew tomato plants in the courtyard; her proposal was approved following the same process. Similarly, a resident successfully placed his own birdfeeder in the courtyard; however, if he did not take the initiative in requesting information, no one would know that a personal birdfeeder is allowed. On the one hand, the restriction seems to increase safety and reduce staff workload in taking care of an addition of environments. On the other hand, it sacrifices residents' desires of personalization and meaningful engagement. By controlling one's environmental knowledge, the courtyard is shaped into a place that meets organization's needs.

C. Linkage of the experiential attributes

A total of 122 rules (Appendix P) are grouped under the nine experiential attributes. Each rule is assigned with a negative or positive score, indicating its impact on the related attributes. Overall results are shown in Table 7-24 and Figure 7-13, which suggest experience of “Social interaction”, “Sensory stimulation” and “Familiarity” are promoted but the rest of the attributes are discouraged.

One unique feature of this courtyard is that “Awareness and orientation” and “Sense of ownership” of residents are deprived. It may be a result of top-down information flow and it definitely limits expansion of residents’ environmental knowledge and choice of personalization. However, as discussed earlier, few residents and family members who take the initiative in negotiating with the administrator get their way, that is, the facility puts residents in a situation where the squeaky wheel gets the oil when dealing with resident’s control and choice of environments. The lack of bottom-up, comprehensive and consensual approach to some extent creates disparity between different levels of cognitive and communication ability; residents with cognitive impairment get only what the facility prepares for them.

Table 7-24. Grouping and evaluating the rules of Elderly Living

<i>Experiential attributes</i>	<i>Sub-theme/code of rules (# of rules)</i>	<i># of rules related to the attribute</i>	<i># of positive (+) or negative (-) rules to the attribute</i>		<i>Summary</i>	
					<i>+</i>	<i>—</i>
Privacy	Control of information/ Levels of visibility (3)	3	+2	-1	+3	-3
	Control of information/ Flow of personal information (3)	3	+1	-2		
Social interaction	Limited surveillance resource/ A quick stop (3)	2	0	-2	+19	-7
	Extension of indoor space/Accommodation of activities (11)	9	+6	-3		
	People crowding in shady spots/ Spontaneous socialization (6)	6	+6	-1		
	People crowding in shady spots / Control of interactions (5)	5	+4	-1		

	People crowding in shady spots / Less restriction (3)	3	+3	0		
Accessible space and built features	Out of care-delivery area/Sporadic care service (5)	5	+1	-4		
	Things may get easy and difficult / Free and easy access (11)	11	+5	-6	+6	-11
	Safety concerns/ physical hazards (2)	1	0	-1		
Sensory stimulation	Low freedom of choice/ Familiar activities (5)	4	+2	-2		
	An uninteresting place/ Vision, touch & motion (6)	6	+5	-1		
	An uninteresting place / Smell, taste and auditory (6)	6	+4	-2	+17	-9
	An uninteresting place / Weather adjustment (10)	10	+6	-4		
Safety and security	Safety concerns/behavior conflicts (2)	2	0	-2		
	Safety concerns/Neglect (5)	5	0	-5		
	Safety concerns/Physical hazards (3)	2	0	-2		
	Limited surveillance resource/ Observation from indoor spaces (4)	4	+3	-1		
	Limited surveillance resource/ Being inconvenient to drop by (1)	1	0	-1	+9	-17
	Things may get easy and difficult / Free and easy access (11)	10	+5	-5		
	An uninteresting place / Weather adjustment (10)	1	0	-1		
	Low freedom of choice/ Familiar activities (5)	1	+1	0		
Familiarity	Low freedom of choice/ Familiar activities (5)	5	+3	-2		
	An uninteresting place/ Vision, touch & motion (6)	5	+4	-1	+10	-5
	An uninteresting place/ Smell, taste and auditory (6)	5	+3	-2		
Awareness and orientation	Control of information/ Information awareness (13)	13	+3	-10	+3	-10
Sense of ownership	Low freedom of choice/ Familiar activities (5)	3	0	-2		
	Low freedom of choice/ Choice of control (4)	4	0	-4	0	-6
Participation in meaningful activity	An uninteresting place/ Vision, touch & motion (6)	1	0	-1		
	An uninteresting place/ Smell, taste and auditory (6)	1	0	-1	+4	-3
	Extension of indoor space/ A place of care or activity programs (2)	2	+2	0		

Low freedom of choice/ Familiar activities (5)	3	+2	-1
--	---	----	----

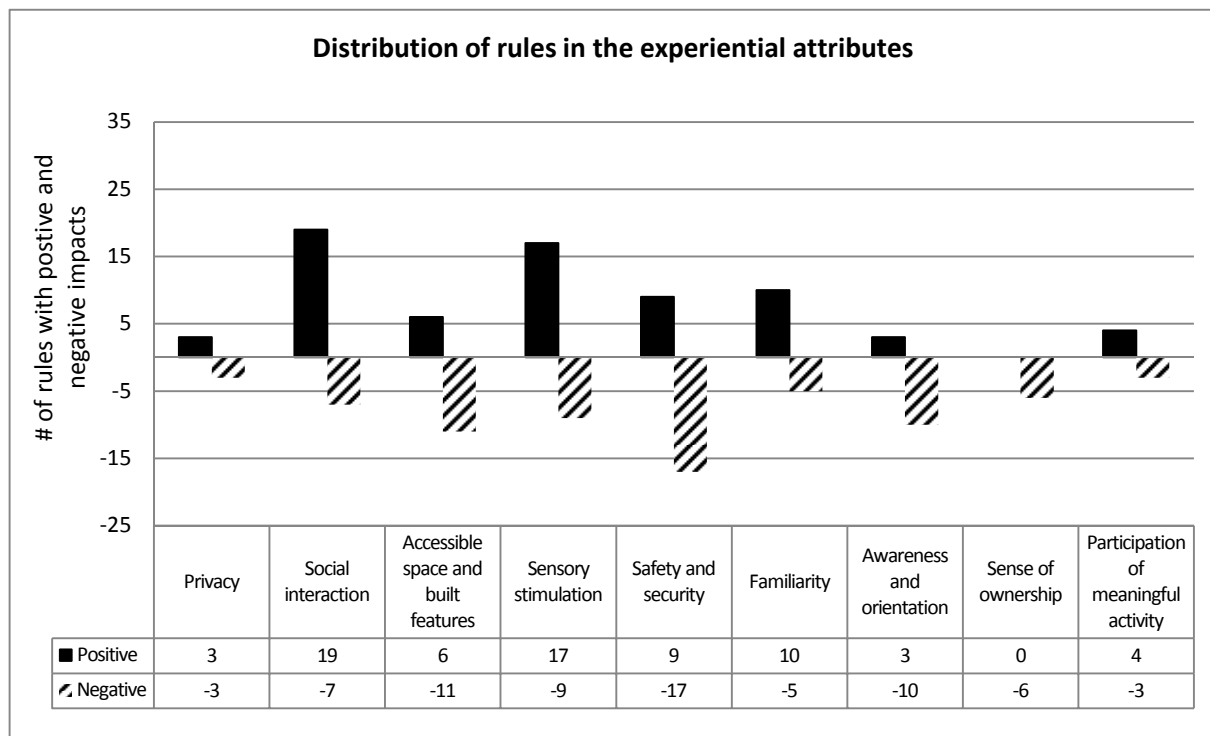


Figure 7-13. Grouping and evaluating the rules of Elderly Living

IV. Comparison of Hidden Rules

The following section reveals common features across the cases and uniqueness of each courtyard. Results in terms of 1) general patterns of courtyard users, 2) patterns of rules and 3) linkage of the nine experiential attributes are compared. In general, Silver Life's courtyard outperforms than the other two cases from the three perspectives of analysis.

A. General patterns of courtyard users

Comparison of general patterns is summarized in Table 7-25. Each nursing home had different characteristics of residents and staff resources (see analysis of staff resource and resident profile in Chapter 6), which may influence how its courtyard is used. Silver Life had the second most amount of

population and lowest percentage of non-ambulatory residents. Frequency of resident users in Silver Life's courtyard was as twice as much of that in the other two cases. Silver Life also had the highest frequency of staff visitors. Although Elderly Living had the most abundant staff resources, it was characterized by the lowest frequency of staff visit. The data confirms the observation that residents were very likely to be left at the courtyard for more than two hours without staff's awareness.

Silver Life had more female residents and its courtyard was dominated by female users. Female population is also higher in Elderly Living but its courtyard had users from a good mix of both genders. Golden Age housed the least number of residents and highest percentage of non-ambulatory residents. Although it had an almost equal amount of male and female residents, the courtyard was mainly used by men. Its courtyard should be the emptiest because of the lowest amount of visitors per hour.

Users' mobility was especially homogeneous across the cases; most of the resident users were wheelchaired, and few ambulatory or walker users were found. Wheelchair power doors were an essential feature in helping residents get in and out of the courtyards. Each courtyard was dominated by individual residents with different types and amounts of group users. Silver Life had more residents (person-times) in resident-led groups; its free access to the courtyard and responsive care-service (e.g., deliver lunch, water and medicine to the courtyard) may make residents more willing to use the outdoor space. Golden Age's courtyard was not so attractive to family groups because it was poorly furnished and hardly converted into a picnic or party venue. It was more regarded as space for staff-led activities. The courtyard in Elderly Living was heavily used by family groups; there was always family members occupying screened seats in a pergola or bringing residents to the courtyard for a walk. Staff were not taking advantages of the courtyard, which created a lowest percentage of residents in staff-led groups.

In the three courtyards, people started gathering one hour before lunch. More residents and family visited the courtyard in the afternoon. During peak hours, each courtyard had at least 60 square-foot patio space for a courtyard user on average. The Golden Age's courtyard, although smallest,

provided the most spatial paved area for an occupier (137.09 square feet per person). The emptiness actually reflects several deficiencies of physical environments; for example, some residents were unable to find a shady spot so they went back inside; only residents who occupied the tree shade stayed longer.

A low incident rate of active interaction with nature is another feature shared by the three courtyards. Most of residents interacted with environments passively; observing nature/ people, napping and talking were major activities. One unique activity that dominated Silver Life was “passing through”. Staff, residents and family members used the courtyard as a shortcut to travel between two corridors. These passersby initiated spontaneous social interaction with courtyard users and helped monitor the environments. In Elderly Living, “arranging furniture” was frequently carried by family members. People competed for shady spots; they dragged chairs to where shade is. They also used the chairs to define their social space.

Table 7-25. Comparison of general patterns of courtyard use

		Silver Life	Golden Age	Elderly Living
Basic information of facility				
# of residents (male/female)		96 (19/77)	51(28/23)	124 (unknown)
Nurse–resident ratio / Aide–resident ratio		1:11/1:9	1:20/1:81	1:9/1:8
# of activity staff		6	3	5
% of residents in levels of mobility	Without help in walking	5%	8%	25%
	Some help in walking	85%	25%	50%
	Unable to walk	2%	67%	25%
Courtyard usage				
Average person-times per hour	Resident	10.86	4.47	5.00
	Family	4.98	0.51	3.09
	Staff	2.84	0.46	0.27
Gender (person-times)	Male	83 (4.07%)	146 (81.56%)	152 (51.88%)
	Female	383 (82.01%)	33 (18.44%)	141 (48.12%)
Mobility (person-times)	Ambulatory	19 (4.07%)	18 (10.06%)	1 (0.34%)
	Walker	65 (13.92%)	20 (11.17%)	2 (0.68%)
	Wheelchair	383 (82.01%)	141 (78.77%)	290 (98.98%)
Group Type	Individual	244 (52.25%)	117 (65.36%)	152 (51.88%)

(person-times of residents)	Family-led	116 (24.84%)	14 (7.82%)	114 (38.91%)
	Staff-led	74 (15.84%)	48 (26.82%)	17 (5.80%)
	Resident-led	33 (7.07%)	0 (0%)	10 (3.41%)
Peak hours	11 am to 4 pm	11 to 12am 1 to 3pm	11 to 12am 1 to 3pm 4 to 5pm	
Minimum square footage of patio space per person during peak hours	75.76	137.09	67.56	
The three commonest courtyard activities	1. Passing through the courtyard 2. Observing nature/people 3. Napping	1. Napping 2. Observing nature/people 3. Group talking	1. Group talking 2. Observing nature/people 3. Arranging furniture	
Incident rate of active interaction with environment (gardening, arranging furniture, organizing environments etc.)	3.6%	4.3%	9.5%	

B. Patterns of rules

Comparison of patterns of rules is summarized in Table 7-26. Each of the courtyards has over 100 implicit rules discovered. These rules do not go beyond discussion of nine thematic topics including 1) staff practice, 2) control of information, 3) accommodation of activity, 4) surveillance or safety, 5) accessibility, 6) people's interaction, 7) sensory experience, 8) choice of activity and 9) personal value. Difference between the courtyards in terms of the nine aspects is just a matter of the extent to which topic is emphasized or overlooked. The nine components form a system with direct or indirect relationships between each other. The pattern of the courtyard in Silver Life (Figure 7-4) illustrates that rules of "people out there" and "unobtrusive surveillance" are the center of the inter-relationships; the two components lead the system and shape the courtyard into an intriguing, social, open but over-protected place.

The pattern of Golden Age (Figure 7-8) centers on rules related to "safety concerns"; it connects with rules related to staff's neglect in the courtyard ("not a necessary care component") and obstacles

to movement (“things my get easy and difficult”). The three components form an axle of the system, directing the courtyard to become unsafe, abandoned, uninteresting but compliant place where residents can still show some of their personalities. The pattern of Elderly Living (Figure 7-12) is characterized by three rule sets: “safety concerns”, “people crowding in shade” and “little control of information”. The triad reflects interactions between staff’s neglect, physical obstacles and organizational top-down attitudes toward residents’ control and choice. It shapes the courtyard into a passive, boredom, social and restrained place that enhances a resident’s subordinate position.

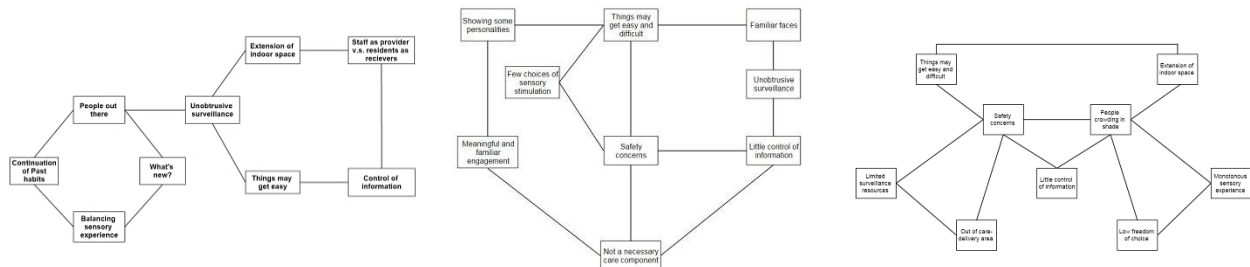
C. Linkage of the nine experiential attributes

Rules emerging from the courtyard were grouped under the nine experiential attributes. Their impacts on the attributes were then evaluated (Table 7-27). In Silver Life, few rules were found to go against the attributes; most of them support “Safety and security”, “Social interaction”, “Sensory stimulation”, “Familiarity” and “Awareness and orientation” in particular. The greatest contrast is with Golden Age. Except “Familiarity” and “Sensory stimulation”, most of the rules obstruct rather than facilitate the attributes. The hazardous environments may be the most serious issue in Golden Age. Its “Safety and security” was shaped by only negative rules. Different from the other two courtyards, Golden Age supports “Sense of ownership”. Its residents have more control over the courtyard. In Elderly Living, “Social interaction”, “Sensory stimulation” and “Familiarity” were promoted but the rest of them were overlooked. “Sense of ownership” and “Awareness and orientation” were shaped by few rules that support action of control and choice.

Table 7-26. Comparison of patterns of implicit rules

Silver Life	Golden Age	Elderly Living
100 rules	127 rules	130 rules
Sub-themes of implicit rules		
1. Staff as providers & residents as receivers 2. Little control of information 3. Extension of indoor space 4. Unobtrusive surveillance 5. Things may get easy 6. People out there 7. Balancing sensory experience 8. What's new 9. Continuation of past habits	1. Not a necessary care component 2. Little control of information 3. Unobtrusive surveillance 4. Things may get easy and difficult 5. Familiar faces 6. Few choices of sensory stimulation 7. Meaningful and familiar engagement 8. Safety concerns 9. Showing some personalities	1. Out of care delivery are 2. Little control of information 3. Extension of indoor space 4. Limited surveillance resources 5. Things may get easy and difficult 6. People crowding in shade 7. Reducing sensory overload 8. Safety concerns 9. Low freedom of choice

Mapping the subthemes



The Center of the patterns

"People out there"	"Safety concerns"	"Safety concerns"
"Unobtrusive surveillance"		"People crowding in shade"

Table 7-27. Comparison of evaluation of rules related to the nine attributes

	Social				Accessible		Sensory		Safety		Familiarity		Aware. &		Meaningful			
	Privacy		interaction		features		stimulation		security				orient.		Ownership activity			
Silver Spring	2	-3	19	0	3	-6	18	-3	34	-5	18	0	17	-3	3	-5	5	-2
Golden Age	2	-6	8	-8	5	-13	12	-7	1	-18	15	-2	2	-10	8	-8	3	-1
Elderly Living	3	-3	19	-3	10	-12	18	-12	8	-19	9	-7	3	-10	0	-9	6	-2
Total	8	-13	43	-11	18	-33	47	-23	42	-40	40	-8	22	-24	8	-20	14	-5

Convergence of all rules may help depict nature of the three courtyards. As shown Table 7-27 and Figure 7-14, “Social interaction”, “Sensory stimulation,” and “Familiarity” are dominant experience. Other attributes such as “Privacy”, “Sense of ownership”, “Participation in meaningful activity” and “Accessible space and built features” are compromised or disregarded. The three courtyards did address experience of “Safety & security” and “Awareness & orientation”; however, the effort may be offset by an almost equal amount of negative effects from the rules.

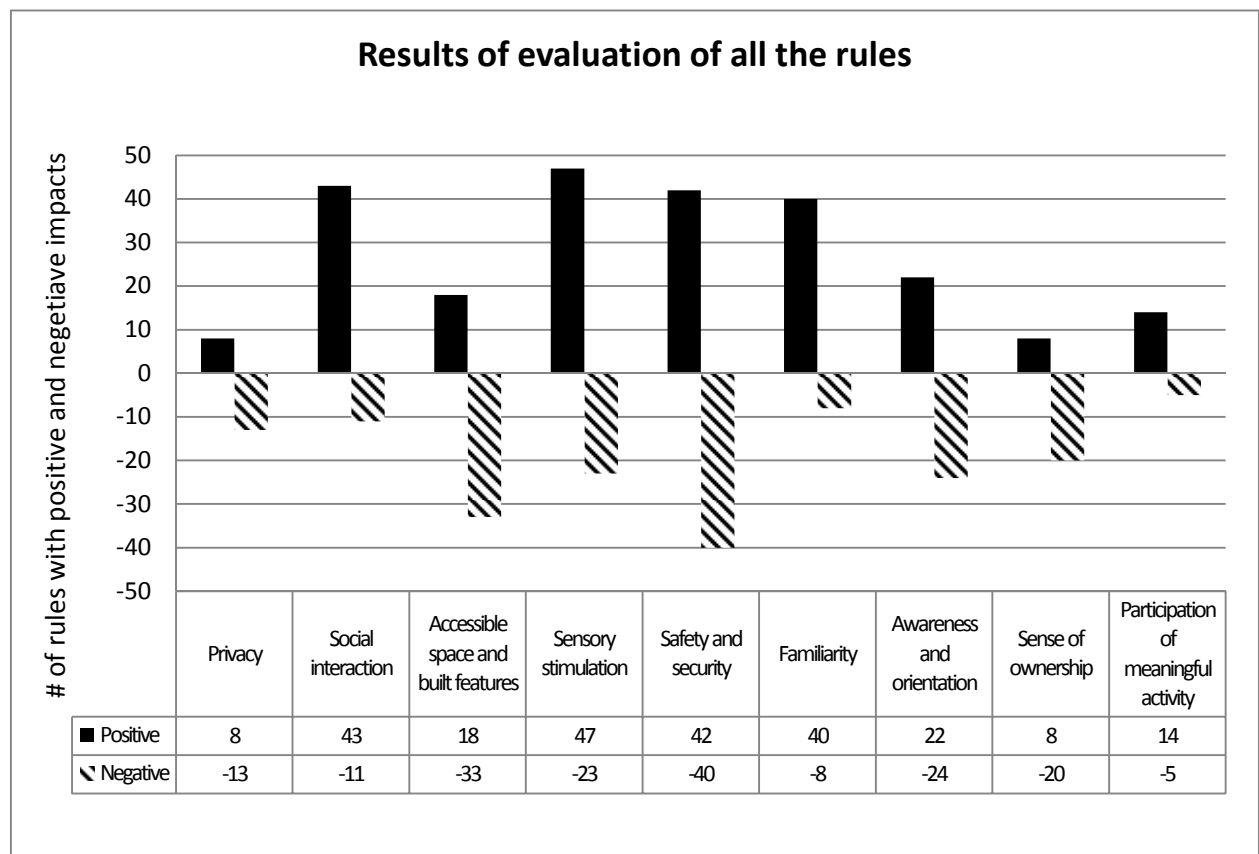


Figure 7-14. Convergence of evaluation of all the internal rules

CHAPTER 8 : PLACE EXPERIENCE OF THE NURSING HOME COURTYARDS

This chapter summarizes the discussions and results of evaluation about place experience of the courtyards. Place experience was analyzed in terms of the support for the nine desired attributes from different contexts. The nine attributes include 1) Privacy, 2) Social interaction, 3) Accessible space & built features, 4) Sensory stimulation, 5) Safety & security, 6) Familiarity, 7) Information awareness & spatial orientation, 9) Sense of ownership, 10) Participation in meaningful activities. These attributes represent shared-values pursued across scholars in the 44 articles on institutional outdoor environments reviewed in Chapter 2. To understand how the courtyards shape the nine attributes, physical settings were assessed in Chapter 5 using the Courtyard Audit Tool for Physical Settings (Appendix G). The auditing evaluation generated a score for each attribute. A higher score indicates that an attribute is more positively and steadily shaped by courtyard's spatial, sensory and building-system properties. Chapter 6 disclosed people components. To understand how people components shape the nine attributes, organizational features were evaluated using the Courtyard Audit Tool for Organization (Appendix J), and staff practice was assessed using the Courtyard Audit Tool for Staff-Resident Interactions (Appendix K). Residents' home-garden/gardening experience was also analyzed. Themes emerged from resident interviews were linked with the attributes. In Chapter 7, internal rules of each courtyard were grouped by the nine attributes. Each rule was assigned a positive or negative score to indicate its impact on the attributes. A summary of the scores of all rules under an attribute indicates the extent that an attribute is supported by place use.

This chapter puts these different pieces together by providing comparison of the results of these four assessments. The purpose is to reveal which attributes are collectively emphasized or overlooked by different subsystems of the courtyards. In each evaluation, scores of the nine attributes were analyzed using percentile rankings (top, middle and bottom third rankings), which helps identify favorable and unfavorable attributes.

To visualize the results, the three rankings (top, middle and bottom third rankings) were assigned with different symbols. Each place is thus transformed into a unique graphic pattern of experiential attributes (Table 8-1, Table 8-3 & Table 8-5). The pattern is like an identification mark, describing each courtyard as an “experiential compound” of the nine attributes. To show which courtyard is more closed to a “home-like” image, each courtyard in terms of its experiential compound is compared with residents’ home-garden/gardening experience.

Discussion of the three individual courtyards is followed by review of shared experiential qualities among the three cases. The shared features suggest agreed-on and constructed value in maintaining functional effectiveness in today’s societal contexts. Following that is the analysis and selection of a relatively successful case. A courtyard with relatively strong and equal emphases on the nine attributes is deemed as more successful. It may serve as a role model for other cases. However, a less effective courtyard has its excellence in certain attributes; its unique patterns of contexts may guide other cases for future improvement.

I. Contexts and Place Experience

In the following section, each courtyard is reviewed with a brief of its contexts and a summary report of evaluations regarding supportiveness to the attributes.

A. Silver Life's courtyard

1. Contexts of the courtyard

Physical settings:

In terms of physical settings, the courtyard is enclosed by double-loaded corridors. Located at the center of the buildings, it is visible from the inner ring of the corridors. Besides bedrooms, it has visual connection with indoor public areas such as a main corridor, an activity alcove, a church, and activity room. Its physical connection with indoor space is limited. Two major entries/exits lead people to two corridors, and one side door usually used by staff lead users to the church. Another spatial feature is a long traveling distance from a bedroom to the courtyard. The longest travel distance from a resident room to the courtyard space is 240 feet. It is easier to walk from the dining room (52 ft.) and activity room (66 ft.) to the courtyard. The courtyard layout is simple— a patio sandwiched by two grass areas. The patio at the center is a big piece of cement area with no definite sections to indicate gathering space or walkways; it accommodates most of spontaneous and programmed activities.

Silver Life provides the most spacious courtyard space for each resident among the three cases (143 square feet per bed) and a medium paved area (activity area) (22.7 square feet per bed). The two numbers exceed the standards required by Wisconsin and other states.

Compared with the other two cases, Silver Life's courtyard provided positive sensory-stimulation. The courtyard contains plants and furniture with a variety of higher-saturation colors which stimulate visual interests. It was quiet but became noisy when background music was turned on. Garden-grown vegetables and herbs may serve as sources of texture, olfactory and tasting experience. The courtyard contains some wheelchair-accessible features, variety of shading device, options of outdoor furniture

and accessories (e.g., birdfeeders and flower baskets). These features facilitated access to the courtyard and natural materials and also sheltered courtyard users. One thing that is lacking on the site was a gardening setting with a raised planting area and prosthetic gardening tool because some residents still have desires to take care of plants.

People:

Silver Life is a licensed and certified Wisconsin nursing home, and is a for-profit organization owned by a small corporation. Like the other two facilities, its organizational structure is similar with what Mintzberg called “Professional Bureaucracy” (Mintzberg, 1979). Silver Life has a relatively flat and flexible structure. Although the administrator supervises department directors, she also interacts with front-line staff, residents and family members to deal with different issues. In general, Silver Life admitted or expected residents who require little behavioral management. The top priority of service in Silver Life is provision of quality health services and daily assistance; less attention is paid to maximizing resident control and policy choice.

From the administrator’s perspective, the courtyard is not a critical feature in care services but an addition to improve quality of life and to increase marketability. Therefore, it is very important to provide activities for life enrichment and to maintain attractive appearance in the courtyard. Silver Life’s outdoor program aims to enrich cognitive and sensory experience. An annual festival, field trips, happy hours, exercise and outdoor classes were planned by following that goal. The program was usually planned by activity staff with some input from the administrator and residents. Courtyard activities were listed in activity calendars, allowing residents to predict events and manage their schedule beforehand. Majority of planned activities were passive; they required little body motion or change of environments. Gardening and other active interaction with the courtyard (e.g., decorating space) were arranged once in a while.

Outdoor policy in Silver Life was co-decided and constantly updated to meet needs. It was communicated with residents in several ways such as one-on-one meeting or resident councils. Its policies or rules related to availability, safety, and outdoor eating facilitate spontaneous social activities. Family members were given some autonomy in initiating a party, watering courtyard plants, and decorating space outside of a resident's window. Feeding animals was prohibited to maintain neat and clean environments. Slight or temporary changes of environments such as adding a birdfeeder or placing flower basket were allowed without any approval, but permanent changes that have obvious influence on appearance such as adding a memorial plate and creating garden space need the administrator's permission. In the past, permanent changes of the courtyard had been initiated by different roles (the administrator, maintenance staff, activity director and family members) except residents.

Silver Life had more varieties of medical and other health-related employees. In 2013, the day shift of nurse-resident ratio was 1 to 11, and aide-resident ratio was 1 to 9. Staff were provided with different training programs and learning resources. In terms of length of employment, Silver Life had 80 percent of full-time nurse employed for at least one year (the lowest turnover of nurses among the three cases) but a fast full-time aide turnover (35% stayed over 12 months). Like the other two courtyards, staff-resident ratio in an outdoor activity of Silver Life was around 1 to 10 or 1 to 15. Staff were the major gardeners and decision-makers. The administrators selected flowers and staff maintain the plants. A group gardening activity was arranged once a year. Afterwards, the gardens were mainly for visual appreciation. Some residents would occasionally make spontaneous gardening like deadheading or picking up tomatoes.

The administrator perceived the courtyard as space with "multiple-ownership"; however, staff did not perceive it in the same manner. Activity staff felt that residents have little control over the courtyard; they were striving for more resident's ownership.

Silver Life had the second most amount of population (96 residents in 2013). Over 70 percent of its residents were over 85 years old. They were characterized by a higher educational level, and a more homogeneous ethnic background (approximately 99 percent of the residents were Caucasians). Over 70 percent of Silver Life's residents had issues of incontinence and handling money. Approximately 10 percent require staff's complete assistance in walking—the lowest percentage of non-ambulatory residents among the three cases. There were approximately 90 to 95 percent of the residents had history or interests of gardening. Twenty-one residents (six males and 15 females) of Silver Life participated in interviews of home garden experience. The average age of the participants was 87 years. The results of content analysis show that “sensory stimulation” and “garden rules” were the two most frequently discussed themes, followed by “my home” and “shared & compromised gardens”.

Internal rules:

In general, frequency (person-times) of resident and staff users was much higher than that in the other two cases. The courtyard was dominated by female residents who were wheelchaired. Like the other courtyards, most of the resident visited the courtyard alone but Silver Life had more residents (person-times) in resident-led groups. Most of residents interacted with environments in a passive manner. Major activities were observing nature/people, napping and conversing. Another common behavior was “passing through”. People used the courtyard as a shortcut to travel between two corridors. Passersby often initiated social interaction with courtyard users and carried out surveillance at the same time.

A total of 100 different internal rules were found (Appendix N). Nine sub-themes emerged from the rules including 1) staff as providers & residents as receivers, 2) little control of information, 3) extension of indoor space, 4) unobtrusive surveillance, 5) things getting easy, 6) people out there, 7) balancing sensory experience, 8) what's new, and 9) discontinuation of past habits (Table 7-7). The nine rule sub-themes are interrelated and form a system (Figure 7-4). The center of the system consists of

three sets of rules: “people out there”, “unobtrusive surveillance” and “what’s new”. Dynamics of the three sets of the rules lead the courtyard to a very social and familiar setting.

2. *Experiential compound—Identification mark*

Overall, Silver Life’s courtyard was very gregarious, communicative and affable but had little affective sharing with residents. The personality is shaped by consistent efforts from different subsystems in “Social interaction” and “Information awareness & spatial orientation”. It is also shaped by consistent neglect of “Sense of ownership” and “Participation in meaningful activities”. Table 8-1 shows the results of the evaluation and illustrates roles of 1) physical settings, 2) organization, 3) staff-resident relations, and 4) place rules in shaping the nine attributes. In each evaluation, the score of each attribute that indicates the supportiveness of environments is translated into percentile rankings. An attribute with consistent support (e.g., Social interaction) suggests that it is in the top third rankings of the attributes in most of the assessments. An overlooked attribute (e.g., Sense of ownership) is the one that is in the bottom or middle third rankings in each evaluation. An attribute with divergent support (e.g., Accessible space and built features) means that it is in either top or bottom third rankings in some of the evaluations.

Table 8-1. Place experience of Silver Life’s courtyard

Type of evaluation	Social Privacy	Social interaction	Accessible features	Sensory stimulation	Safety security	Awareness Familiarity & orient.	Awareness Ownership	Meaningful activity
Phys. Settings	●	●	●	○	●	●	●	○
Organization	●	●	○	●	●	●	●	○
S-R* relations	●	●	●	○	○	●	●	○
Internal Rules	○	●	○	●	●	●	○	●

● Top third rankings; ● Middle third rankings; ○ Bottom third rankings

* S-R relations: Staff-resident relations

Consistent attention and unconcern:

“Social interaction” was encouraged collectively by physical settings, people components and rules of place use. In terms of physical settings, the architecture layout in which the courtyard is located at the center is an important factor. The courtyard served as a shortcut between corridors in summer, and many staff passersby interacted with courtyard users on their way to work. In addition, adequate movable chairs and tables as well as shade device facilitated social gathering and sustained a longer outdoor stay. Different landscape materials, vegetables and herbs triggered sensory experience and became topics of conversation starters. The courtyard was also featured by flexible outdoor eating policy, which encouraged spontaneous family activities or resident social groups. For example, family members were allowed to use a facility’s gas grill in a family cook out party. Family picnic and resident outdoor lunch were encouraged; kitchen staff would deliver lunch meals to the courtyard by resident requests.

Outdoor social activities were regularly scheduled by staff. In a large annual event, the courtyard was decorated for a particular festival. Family members were usually invited to enjoy food and music with residents. In small events, social interactions were encouraged through activity participation like drawing or ball tossing. Many spontaneous social interactions also occurred in the courtyard. When staff delivered care service to courtyard users, pass through the space, or maintain the courtyard, they would start random conversations with family members and residents. In such circumstance, surveillance became unobtrusive and was normalized in daily conversation or casual conversation. Finally, people’s activities in the courtyard could serve as a cue conveying an image of relaxing and less restrictive social atmosphere. The behavioral cues in the courtyard include reading a book, napping, talking to visitors, laughing, eating and listening to music. These types of behavior sent a message that “there are always people out there”.

“Information awareness & spatial orientation” and “Familiarity” were also promoted collectively but with less congruent efforts. For example, although staff practice and the organization addressed communication regarding policies and activity information, few resources (e.g., a sign, map, clock, thermal meter and plant name tag) were provided to allow residents to acquire information autonomously. “Familiarity” was sometime compromised by an attempt to maintain resident’s safety. The organization and staff were hesitant to provide familiar activities such as gardening due to inadequate staff in one-on-one or group gardening; however, self-initiated gardening such as deadheading, and picking up vegetables was still found happening in the courtyard. The spontaneous gardening may suggest that residents tried to follow their garden rules and make courtyard gardens more close to their ideal one.

“Sense of ownership” and “Participation in meaningful activities” were steadily overlooked. Residents were not decision-makers in outdoor programs and settings. Few opportunities in the courtyard would enhance self-usefulness. The deficiency may be moderated when family members on behalf of residents take action in personalizing environments.

Divergent directions:

“Privacy”, “Accessible space and built features”, “Sensory stimulation”, and “Safety & security” were supported with divergent efforts. For instance, “Safety and security” is emphasized in the organizational policy and staff practice. Staff passersby would check courtyard users’ need and deliver service to residents so residents have no need to travel back and forth. However, there was no emergency communication device allowing outdoor residents to contact indoor staff, and staff was unable to watch the courtyard from the activity offices. If there are no people pass by, it is impossible to ask for help in the courtyard.

Comparison with residents' home garden experience:

A total of 27 sub-themes of home garden experience had emerged from interviews with 43 residents from the three facilities (see discussions in Chapter 6). They were grouped under the nine attributes. Each attribute includes several sub-themes. Frequencies of all sub-themes under an attribute represent a degree of importance in residents' home garden experience. Based on the frequencies, the nine attributes are divided into three percentile groups (top, middle and bottom third rankings). The results are shown in Table 8-2.

Table 8-2. Comparison of place experience between Silver Life's courtyard and home garden/gardening

Home gardens									
Type of evaluation	Privacy	Social interaction	Accessible features	Sensory stimulation	Safety security	Familiarity & orient.	Awareness	Ownership	Meaningful activity
Exp. of home gardens	○	○	●	●	●	○	●	●	●
Silver Life's courtyard									
Phys. Settings	●	●	●	○	●	●	●	○	○
Organization	●	●	○	●	●	●	●	○	○
S-R* relations	●	●	●	○	○	●	●	●	○
Internal Rules	○	●	○	●	●	●	●	○	●

● Top third rankings; ● Middle third rankings; ○ Bottom third rankings

* S-R relations: Staff-resident relations

The juxtaposition of place experience of home gardens and Silver Life's courtyard suggests that "Information awareness & spatial orientation" is addressed in both settings. When describing home gardens, residents showed a strong awareness of seasonal change and knowledge of rhythm-based home gardening. They were gardeners who were able to anticipate what would happen and know what should be prepared for the growing season. In Silver Life, the attribute was supported by high visibility of the courtyard. Residents were able to obtain outdoor information from their rooms and public indoor space. Staff were well-trained to provide information regarding choice of seats in the shade or sun, options of lunch location and schedules of upcoming activities so residents were able to expect future

events and make a plan accordingly. If the weather was too extreme, staff would put a written “closed” sign on the entries to prevent any frustration from attempting to open the door.

On the contrary, home gardens were strongly linked with “Sensory stimulation”, “Sense of ownership” and “Participation in meaningful activity” while these attributes were not quite stressed in Silver Life’s courtyard.

B. Golden Age’s courtyard

1. Contexts of Golden Age

Physical settings:

The courtyard of Golden Age is located at the center of the building and enclosed by double loaded corridors. Except bedrooms at the inner ring of the corridors, the courtyard is fully visible from only two spaces: the main dining room/activity room and secondary dining room. There is limited visual access from the office space to allow unobtrusive surveillance. The corridors have no window looking out at the courtyard, thus the staff and residents were unable to receive outdoor information while traveling between indoor spaces.

The main dining/ activity room has both visual and physical access to the courtyard, which facilitates staff to monitor indoor and outdoor residents at the same time. When the weather becomes too extreme, activity groups can be moved into the dining room immediately. In addition, outdoor views service as a visual cue to remind residents of existence of the courtyard and to provide orientation of time and seasons. To residents who like to take a walk after lunch or dinner, the connection may help retrieve an old habit and accommodate their need. Golden Age has a relatively shorter traveling distance from bedrooms or dining space to the courtyard. The longest travel distance from a resident room to the courtyard is 163 feet, and is the shortest maximum distance among the three cases.

The courtyard has a simple layout featured by two equally-sized areas, one of which is the patio space and the other is a piece of grass land with a path penetrating it. Most of outdoor activities were carried on the path and the patio. Overall, it provides the least courtyard space for each resident among the three cases (61 square feet per bed) and the most spacious paved area (activity area) (27.6 square feet per bed); the two numbers exceeded standards required by Wisconsin and other states.

Golden Age's courtyard was lacking in variety of positive sensory experience. Visually, the courtyard was characterized by "faded" colors; colors of the planting and furniture did not stand out but blend in with the background environments. It was quiet with occasional traffic noise. A pond with a water spray was supposed to provide water sounds but its pump was constantly turned off due to maintenance issues. Ground-leveled flowers were for visual appreciation rather than leisure gardening. When there was donation of seedlings, the garden-grown vegetables would serve as sources of tasting experience. The courtyard was poorly furnished. It hardly accommodated any type of social interactions.

People components:

Golden Age was a licensed and certified Wisconsin nursing home; it was a for-profit organization owned by a limited liability company (LLC) partnership. Its organizational structure was similar with "Professional Bureaucracy" (Mintzberg, 1979) but the facility was run as a simple or entrepreneurial organization. The administrator supervised front line staff and attempted to execute her influence over every aspect. There were few staff meetings, and the communication between the administrator and staff tended to be informal. In general, Golden Age was a great contrast to Silver Life; the facility was willing to admit residents with problem behavior. Residents were given more policy choices; however, there was less availability of health services.

A philosophy of managing Golden Age's courtyard was pursuit of low-cost. Given limited budget, outdoor programs were expected to be low-costed; social events with food and band performance were

rarely arranged. The courtyard was viewed as extension of the activity room; when the weather was permitting, some activities were moved to the courtyard. The activity director decided monthly programs with some input from the resident and the administrator. Outdoor activities were listed in calendars. Most of them were activities of reminiscence, exercise and playing games. An annual planting day was usually scheduled in May. After that day, gardening was a spontaneous and individual activity.

In Golden Age, some rules were decided by the administrator. Others were pre-existing policies that were followed before the administrator was on board and therefore, some of them (e.g., availability of the courtyard) were taken for granted and not communicated with residents and new staff, thus there is different interpretations of the usage of the courtyard. Overall, residents and family members were not imposed too much restriction in carrying self-initiative activities (e.g., feeding wild birds with leftover bread, spontaneous gardening) until the administrator or activity director felt there were safety concerns. When the administrator saw something inappropriate, she gave immediate instruction of what should or should not be done.

Golden Age had the least staff resource in terms of varieties of medical and other health-related employees, nurse/aid-resident ratio and volunteer hours. In day shift, nurse-resident ratio was 1 to 20, and aide-resident ratio was 1 to 81. Staff were provided with fewer opportunities of training and education. In terms of length of employment, Golden Age had 50 percent of full-time nurse employed for at least one year and a very fast full-time aide turnover (7% stayed over 12 months). Like the other two courtyards, staff-resident ratio in the courtyard was around 1 to 10. In Golden Age, the activity director was the major gardener; she took care of funding, planning, maintaining and decorating the courtyard. Residents were encouraged to participate in a one-day group planting and allowed to do spontaneous gardening (weeding and watering). When residents make requests of helping water gardens, the activity director would set up hoses for them. Some residents without staff's permission weeded gardens whenever they felt necessary. They were not intervened by staff even when they made

their way onto the grass area and bended their body to pull weeds from their wheelchair. Both the administrator and activity director had proposed changes of the courtyard; however, only the changes initiated by the administrator were executed.

The administrator felt that residents own the courtyard although her style of management did not quite convey the concept. The activity director had strong ownership. She took charge of the courtyard from every aspect. She expressed that it is a dignity issue to her if her ownership of the courtyard is changed.

Golden Age had the fewest amount of population (51 residents in 2013). Compared with Silver Life's residents³⁶, residents in Golden Age were much younger (77.5 years old on average), lower in social and economic background and more diverse in ethnicity (51 % Caucasians and 49% African American and others). A male-female resident ratio was 55 to 45 in 2013; most of the male residents were ambulatory and independent. Golden Age had a higher percentage of residents who are completely dependent in toileting, walking and bathing, and higher percentage of residents with cognitive impairment.

A total of 15 residents (six females and nine males) completed interviews. The average age of the group was 75 years. The content of interviews in Golden Age is not apart from what has been analyzed in data of Silver Life, although fewer themes were discovered. Nine major themes were identified including 1) garden rules, 2) a shared garden, 3) food bank, 4) sensory experience, 5) a nature lab, 6) competing with nature, 7) hard work, 8) feedback, and 9) my home (Table 6-8). Themes of "sensory stimulation" and "my home" were the most popular topics. Under these themes, Golden Age group paid more attention on matters related to "interactions with pets or wild animals" and contents related to practice of gardening such as "principles of better gardening" and "starting from scratch". A

³⁶ Some demographic information of Elderly Living's residents is absent.

new sub-theme, “playground”, was developed and categorized under “My home”. It describes how a home garden was treated as an outdoor play area for children.

Internal rules:

Golden age’s courtyard had a lowest frequency (person-times) of family visitors and resident users on average. The courtyard was dominated by male residents. Most of the resident visitors were individual users but Golden Age had more residents (person-times) in staff-led groups. Most of residents interacted with environments in a passive; the most common activity was “taking a nap”.

A total of 117 different internal rules were found (Appendix O). Nine sub-themes emerged from behavior observation including 1) not a necessary care component, 2) little control of information, 3) unobtrusive surveillance, 4) things get easy and difficult, 5) familiar faces, 6) few choices of sensory stimulation, 7) meaningful and familiar engagement, 8) safety concerns, and 9) showing some personalities (Table 7-15). The nine sub-themes form a system with three rule sets on the center: “Things may get easy and difficult”, “Safety concerns” and “Not a necessary care component” (Figure 7-8). They interact with each other and direct the courtyard into a social, gendered and neighborly setting.

2. Experiential compound—Identification mark

Golden Age’s courtyard was flexible to accommodate different leisure choice but it was unkempt, unsafe, and boring at times. The personality was shaped by consistent efforts in “Familiarity” from different sub-systems of place but also caused by divergent attention on “Sensory stimulation”, “Safety & security”, “Sense of ownership” and the other attributes. As shown in Table 8-3; most of the attributes were not supported completely by the courtyard as a whole system. Except “Privacy”, “Accessible space and built features” and “Familiarity”, the rest of the attributes were either valued (in top third rankings) or overlooked (in bottom third rankings) in some of the assessments.

Table 8-3. Place experience of Golden Age's courtyard

Type of evaluations	Privacy	Social interaction	Accessible features	Sensory stimulation	Safety security	Awareness Familiarity & orient.	Ownership	Meaningful activity
Phys. Settings	○	○	●	○	●	●	●	●
Organization	○	●	●	○	●	●	●	○
S-R* relations	○	●	○	●	●	●	○	○
Internal Rules	●	●	○	●	○	●	○	●

● Top third rankings; ● Middle third rankings; ○ Bottom third rankings

* S-R relations: Staff-resident relations

Consistent attention and unconcern:

In Golden Age, “Familiarity” was consistently promoted by people components, physical settings, and rules of place use. For example, the organization allowed residents to carry some familiar activities like smoking, gardening and feed wild birds with leftover bread. Staff served as facilitators in some of these activities; they set up hoses for residents to water plants or clean up snow for outdoor smoking. Residents could mess up the floor when weeding or spreading bread but no staff intervened in their action. In the courtyard, sensory stimulation may be triggered by local plants donated by staff and volunteers. Residents had chances to taste the home grown vegetables in their meals which was raised from the courtyard gardens.

On the contrary, “Privacy” and “Accessible spatial and built features” were collectively overlooked. There were no proper screening seats in the courtyard. Policies and staff practice did not address residents’ control of personal information either; conversations between family members or consultation were easily overheard in the courtyard. To maintain privacy, residents would sit at the edge of the central patio or the path because it is away from visual focus. Family members would arrange patio chairs in a circle to create a sense of enclosure, a boundary for social space.

There were several obstacles to access to the courtyard. For example, the entry at the dining room has a sliding door with a heavy glass panel and a high threshold. Wheelchaired residents would either propel themselves to the power door at the other side of the building or ask staff’s assistance in

transportation through the sliding door. However, there were only two regular activity staff members; when they led a group activity or carried other tasks, residents' request of assistance was likely to be delayed or unmet. The delay was caused by a lack of teamwork among departments; activity staff received no help from nurse aids or other staff.

Some accessibility issues were related to limited shade and lack of proper furnishing. In the courtyard, shade was only provided by an oak tree in the afternoon. Residents competed for a shady spot under the oak tree along the path area in the afternoon. When its entry was occupied by a wheelchair user, other residents would either return to the building or bypass the blocker and walk on the grass area. In the courtyard, residents and family members would hold onto their food, drink or entertainment devices or place them on the floor because there was only one table and is heavy and not portable.

Divergent directions:

Most of the attributes were compromised by some conflicting efforts. For instance, one goal of this courtyard was to facilitate and foster social interaction but inadequate chair-table sets, insufficient shade and cigarette stench undermined the attempt. No funding was assigned for any plant material. The activity director had to coordinate fundraising events and seek for plants donation. Unfortunately, external support was unstable thus making the quality of sensory experience inconsistent year by year. The administrator was not eager to improve the courtyard so the director was left to fight a lone battle.

There are potential safety issues in the courtyard. For example, there were only two regular activity staff members; while they were busy in transportation and carrying activities, the courtyard was being neglected. It had been found that wheelchaired residents helped each other to maneuver around pavement cracks. By helping each other, residents would feel their worthiness but at the same time they endangered themselves in a hazardous situation. Too often, some residents would attempt to do some gardening without staff's supervision. They may fall if they try to stretch and reach for the weeds.

There was some meaningful engagement in the courtyard. Some residents in the courtyard helped staff maintain gardens. Tasks like watering may enhance senses of usefulness and help re-establish a past social role as a greenhouse worker or home gardener. However, staff had limited resource to emphasize positive feedback; there was no physical space to credit residents' garden work or display their creativity.

Comparison with residents' home garden experience:

One shared quality between Golden Age's courtyard and residents' home gardens is the de-emphasis of "Privacy" and "Accessible space and built features" (Table 8-4). However, it is reasonable that the two attributes were more hidden in the home garden experience because privacy is very likely to be taken for granted in a home setting and so is accessibility. Mobility and accessibility was not an issue when residents still lived at home and owned a home garden. However, a nursing home courtyard without taking into account these attributes may deprive residents' control over environments.

Three dominant attributes of home garden experience: "Sensory stimulation", "Information awareness & spatial orientation" and "Sense of ownership" were not fully supported by Golden Age's courtyard. Experience that is very common in home gardens such as tasting food, harvesting vegetables and tilling soil was less likely to happen in Golden Age. The home-garden experience regarding awareness and orientation describes residents' knowledge of gardening. In Golden Age, staff had few attempts of applying residents existing knowledge to gardens or encouraging them to learn new things through gardening processes. Although approximate 90 to 95 percent of residents had gardening experience, staff created very few opportunities to help retrieve or expand their expertise. Such staff practice may be related to a mindset that views residents as "helpers" and "volunteers" rather than "teammates".

Table 8-4. Comparison of place experience between Golden Age's courtyard and home garden/gardening

Home garden									
Type of evaluation	Privacy	Social interaction	Accessible features	Sensory stimulation	Safety & security	Familiarity	Awareness & orient.	Ownership	Meaningful activity
Exp. of home gardens	○	○	●	●	●	○	●	●	●
Golden Age's courtyard									
Phys. Settings	○	○	●	○	●	●	●	○	●
Organization	○	●	●	○	●	●	○	●	○
S-R* relations	○	●	○	●	●	●	○	○	○
Internal Rules	●	●	○	●	○	●	○	○	●

● Top third rankings; ● Middle third rankings; ○ Bottom third rankings

* S-R relations: Staff-resident relations

C. Elderly Living's courtyard

1. Contexts of Golden Age

Physical settings:

Elderly Living's courtyard is enclosed by double-loaded corridors in the long-term care units. Access to this courtyard from resident corridors may require much more mental and physical efforts due to a complicated architectural layout. The courtyard has high visibility from the inner ring of corridors; besides bedrooms, it is visible from two public social spaces: the dining room and a resident lounge. The courtyard has five exits/entries leading people to two different corridors, the dining room and a resident lounge; many residents left the courtyard using a different door from the one they entered. The courtyard layout is a complicated one—a figure-8-shaped path at the center stretching to five exits and connecting three patios. The entry patio is adjacent to the resident lounge. A wheelchair power door allows residents to come and go between two spaces. The central patio is well furnished. It accommodates most of activities. The pergola patio provides proper screening and sheltered seating. It

is usually occupied by a family group. The entry and central patio have no proper cue to indicate gathering space or walkways; family members sat wherever they feel comfortable.

Overall, Elderly Living provides the second most spacious courtyard space for each long-term care resident (75 square feet per bed) but the least paved area (activity area) (8.51 square feet per bed); the former exceeded standards required by Wisconsin but the latter is much lower than the other cases and it does not meet a minimum standard required by Connecticut (10 square feet per resident bed for outdoor porches or paved patio areas).

The courtyard was lacking in quality and diverse sensory stimulation. In terms of visual experience, the color of the courtyard was monotonous. Furnishing and flowering plants failed to create visual interests. Glare may be a serious issue during summer months. Except visual appreciation of nature, the courtyard provided no olfactory, auditory and texture stimulation. Occasional vehicle and nearby motor-running mechanic noise was quite disturbing; its sound level was over limits defined by the EPA's (Environmental Protection Agency) and NIDCD's (National Institute on Deafness and Other Communication) for residential areas and hospitals.

Elderly Living's courtyard had the second most resources of built features among the three cases; there was adequate outdoor furniture to accommodate different social activities. It was featured by wheelchair-friendly design such as a wheelchair power door and a raised planting bed. However, it lacks in providing shading device, fun features such as birdfeeders, butterfly attracting flowers and culturally significant decoration to make the space more vivid and interesting.

People:

Elderly Living is a licensed and certified Wisconsin nursing home; it is a for-profit organization owned by a large nursing home chain company. Compared with the other two facilities, its organizational structure has a complicated and hierarchical structure. Decisions are directed from managerial levels down through the hierarchy to the front line staff. The organization has clear skill

division and independent work territory. Staff meetings are important in communication between departments.

A cost-effective concept was embedded in managing the courtyard. The administrator treated the courtyard as a nearby and calm outdoor space. Spontaneous rather than staff-planning activities were encouraged in the courtyard. Activity programs were planned by the activity department with some resident input. No outdoor activity was listed in calendars, although staff would eventually arrange some events such as a happy hour and music performance. These activities were compatible with indoor and outdoor settings; they can be carried in the dining room or activity room. In other words, it is staff's call to decide where an activity is carried. A planting day was usually scheduled in the month of May but according to staff, residents were more like audience watching staff doing the planting. Afterwards, there was no structured nor self-initiative gardening.

Elderly Living shared some features with the other two cases in regard to decision-making of the outdoor policy. Policy related to availability, safety and maintenance were discussed in staff meeting. The administrator set most of the rules. For example, gardening activities or any change of environments (feeding animals, placing a bird feeder or flower basket) were required to get the administrator's approval. In terms of policy communication, there may be some information lost in translation between frontline staff and managerial levels; for example, nursing staff were required to check residents at the courtyard every hour but during the observation, it has been found that residents were left in the courtyard for more than two hours under 90 degree weather.

Elderly Living had the most abundant staff resources in terms of varieties and the amount of medical and other health-related employees; in day shift, nurse-resident ratio was 1 to 9, and aide-resident ratio was 1 to 8. Nurse's length of employment is between that of Silver Life and Golden Age; it had 64 percent of full-time nurse employed for at least one year but 59 percent of full-time aide stayed

over 12 months. Like the other two courtyards, staff-resident ratio in the courtyard was about 1 to 10 or 1 to 15.

The administrator of Elderly Living took more control over the courtyard than those of the other two cases. She was responsible to spring planning, purchase flowers, planting material, and maintenance (e.g. watering), whereas activity staff and residents had little involvement in decision-making. In the planting day, activity staff and residents dug soil and planted what was prepared by the administrator. She reviewed and approved proposals of any change of the courtyard including adding a birdfeeder or removing a grill. In the past, temporary changes of the courtyard like adding a vegetable garden had been initiated and made by a family member and kitchen staff; however, the change did not last long. Once the initiator discontinues to propose and maintain the change, the courtyard was changed back to what it was started. The current activity director and staff never took action in improving the courtyard although they all thought some changes (e.g., adding shade devices) are necessary. In a word, the administrator took full ownership of the courtyard. In certain circumstances, residents may have ownership but it has to be approved by the administrator.

Elderly Living had the most amount of population (124 residents in 2013). Approximately 75 percent of its residents were over 75 years old. They were diverse in occupation and ethnic background (approximately 60 percent are Caucasians, and 40% are African American, Hispanic and others). Over 50 percent of the residents had issues of incontinence and approximately 50 percent required staff's complete assistance in grooming, eating, walking, and bathing.

Approximately 50 percent of the residents had history or interests of gardening. Only seven residents (one male and six females) participated in interviews of home garden experience. The average age of the group is 78.7 years. Ten major themes were identified including 1) garden rules, 2) a shared & compromised garden, 3) food bank, 4) sensory experience, 5) a nature lab, 6) competing with nature, 7) work ethic, 8) hard work, 9) feedback, and 10) my home (Table 6-10). "Sensory stimulation" and "my

home” were the two most frequently discussed themes, followed by “garden rules” and “hard work”. Similar with the interviewees in the other two homes, participants of Elderly Living highlighted food-related sub-themes like “cooking from gardens” and “food bank”. Practice of home gardening related to “dwelling and resting” and “starting from scratch” was reviewed comprehensively too.

Internal rules:

The courtyard had equal numbers of male and female users. Most of them were wheelchaired. Unlike the other two courtyards, individual users did not overly dominate the courtyard (51.88%); many residents were also found in family-led groups (38.91%). Interestingly, although Elderly Living had the most abundant staff resources, its courtyard had the lowest frequency of staff visit. Most of resident users interacted with environments in a passive manner; conversing in groups and observing nature/people were major activities. One unique behavioral feature was that people rearranged furniture quite frequently. They competed for shady spots and dragged chairs to where they would feel comfortable.

A total of 122 different internal rules were found (Appendix P). Nine sub-themes emerged from behavioral observation including 1) out-of-care delivery area, 2) little control of information, 3) extension of indoor space, 4) limited surveillance resources, 5) things get easy and difficult, 6) people crowding in shay spots, 7) an uninteresting place, 8) safety concerns, and 9) low freedom of choice (Table 7-23). Each of the nine subthemes interrelates with all the others and forms a system. The system (Figure 7-12) has a core built on dynamics of three components: “safety concerns”, “people crowding in shade” and “little control of information”. The core represents interactions between staff’s neglect, physical obstacles and a top-down attitude toward control and choice; it shapes the courtyard into a small “public-green-space”- like atmosphere.

2. Experiential compound—Identification mark

Overall, Golden Age’s courtyard was social, family-oriented, and safe environments but yet lacked intriguing, interactive and affectionate relationships with residents. The personality was promoted by relatively consistent efforts in “Social interaction”, “Privacy” and “Safety & security” and also caused by conflict or little attention on the rest of the attributes. As shown in Table 8-5; most of the attributes were not supported completely by the facility as a whole system; they are in either top or bottom third rankings in some of the evaluations.

Table 8-5. Place experience of Elderly Living’s courtyard

Type of evaluation	Privacy	Social interaction	Accessible features	Sensory stimulation	Safety & security	Awareness Familiarity & orient.	Meaningful Ownership activity	
Phys. Settings	●	●	◐	○	●	○	◐	○
Org.	◐	◐	●	○	●	○	◐	○
S-R* relations	●	●	○	○	●	◐	◐	○
Rules	◐	●	◐	●	○	●	○	◐

● Top third rankings; ◐ Middle third rankings; ○ Bottom third rankings

* S-R relations: Staff-resident relations

Consistent attention and unconcern:

Unlike the other two courtyards, none of the attributes remain in the top third rankings in all the four evaluations. Three attributes: “Social interaction”, “Safety & security” and “Privacy” had relatively full support. In the courtyard, physical settings and staff practice facilitated family gatherings; residents’ behavior such as conversing and picnicking conveyed a relaxing social atmosphere; however, some outdoor eating policy was not quite friendly; a family cookout party and having lunch at the courtyard were not allowed. These limitations may reduce workload of maintaining the courtyard but also the fun of sharing food and spending time with family and friends outdoors.

In terms of privacy, there was a pergola to provide seats with screening foliage; people in the pergola were free from being observed. The courtyard is spacious, and chairs and coffee tables were

sturdy and yet portable; family members could easily arrange them from mainstream traffic and create a two-person intimate setting. Moreover, staff did not check the courtyard very often so residents may feel the courtyard is out of staff's watchful eyes. However, privacy was reduced when people crowded in tree shade with little personal space.

Three attributes: "Information awareness & spatial orientation", "Sense of ownership" and "Participation in meaningful activities" were de-emphasized collectively. More specifically, residents in the courtyard may feel being excluded from indoor environments because staff rarely informed outdoor residents about coming indoor activities or reminded them of lunch or dinner time. Also, there was no visual connection between the courtyard and the activity room or main corridors; outdoor residents were less likely to be aware of indoor activities. Likewise, the architectural design disallows residents and staff to obtain outdoor information while making a routine travel between indoor spaces.

The administrator claimed strong ownership of the courtyard. She took full responsibility to maintain the courtyard and residents have little control of the environments. For example, flowers grown in the raised bed was selected by the administrator with little input from residents; one resident express her disapproval of the flower selection by cutting down the plants secretly.

Residents who made negotiation earned some ownership with conditions. However, as discussed in the previous chapters, the negotiating process to some extent reinforces subordination of residents to the administrator. One resident successfully made staff to place his birdfeeder stand in the courtyard; because of that, other residents were able to birdwatch, people started to converse about birds that used to visit their home gardens. According to the resident, he felt that the effort he made is meaningful in a way that he fought for autonomy on behalf of other residents.

Divergent directions:

Three attributes: "Accessible space and built features", "Sensory stimulation" and "Familiarity" had conflict supports. In terms of accessibility, the wheelchair power door has been facilitating free and

easy access. However, some residents liked to use swing doors at the other entries/exits because of close proximity to their room. They were sometime stuck at the door and waited for staff's help; it is very difficult to them to open the swing door while propelling themselves on a wheelchair. While they were trapped, staff were unable to provide immediate help because they rarely visited the courtyard and the courtyard is not quite visible from work places and hallways.

A major goal of this courtyard was to provide calmness through passive interaction with nature. Physical settings were set up for that purpose, and staff practice was to facilitate the process. On the contrary family members brought more fun in the courtyard; they would picnic, sing and play musical instrument in the courtyard. People brought a dog and allowed it to play with residents. Some residents did not just satisfy with visual appreciation of nature; they would touch and check plants but most of the courtyard plants in summer were not characterized nor provide any olfactory and tactile interests.

Some residents liked to take an outdoor stroll after breakfast or lunch. However, the doors to the courtyard were swing doors; residents had troubles to use them without assistance. In order to access to the courtyard using the power door, people had to travel at least 200 feet from the dining room to another side of the building.

Comparison with home garden experience:

"Accessible space and built features" and "Safety & security" were moderately highlighted in both Elderly Living's courtyard and home gardens (Table 8-6). Experience of accessibility in home gardens were referred to processes of how residents started their gardens with many physical obstacles and gradually built up an accessible space. One common example is that they would make plant support with a wood stick, tomato cage or fence to prevent vegetables from falling over and also to reduce body motion such as the constant bending or kneeling. Accessibility emphasized in Elderly Living's courtyard was more related to experience in access to the space rather than in place-making processes. That

means that residents were treated as spectators rather than gardeners in the courtyard. A spectator is often perceived as a role with no need to make decision, take action and control resources.

Table 8-6. Comparison of place experience between Elderly Living's courtyard and home garden /gardening

Home Garden									
Type of evaluation	Privacy	Social interaction	Accessible features	Sensory stimulation	Safety & security	Familiarity & orient.	Awareness	Ownership	Meaningful activity
Exp. of home gardens	○	○	●	●	●	○	●	●	●
Elderly Living's courtyard									
Phys. Settings	●	●	○	○	●	○	○	○	○
Org.	○	○	●	○	●	○	○	○	○
S-R* relations	●	●	○	○	●	○	○	○	○
Rules	○	●	○	●	○	●	○	○	○

● Top third rankings; ○ Middle third rankings; ○ Bottom third rankings

* S-R relations: Staff-resident relations

To most of the residents, home gardening was to ensure food security and sustain family; senses of security of home gardens were embedded with experience of maintaining family values and playing a social role such as a mother or father, who would protect their families. Experience related to “Safety & security” in the courtyard was concerned with prevention of falling, dehydration and other risks. In other words, the status of residents were changed to being protected rather than protectors. One consequence of being treated as protected persons is that defensive resources will be viewed as unnecessary. In reality, staff of Elderly Living do not check outdoor residents on a regular basis; residents have no way to contact indoor staff when they needed help.

Three major attributes of home gardens: “Sensory stimulation”, “Sense of ownership” and “Participation in meaningful activities” were not stressed in Elderly Living's courtyard. The three attributes denotes experiences of tasting and sharing garden-grown food with family, learning new

things and showing one's own values in solving problems. They are less likely to be found in Elderly Living's courtyard.

II. The Shared Experiential Quality among the Three Courtyards

Table 8-7 summarized the attributes consistently promoted or overlooked by the three types of physical settings, people components and place rules. Attributes that are consistently emphasized by three case's subsystems are assigned a "+" symbol; others are given a "-" or "0" to indicate their strength of being supported by the environments.

As shown in the table, "Social interaction" is the most prominent shared attribute; the organizations, staff practice and rules of place use of the three facilities promote people's interaction in the courtyards. However, not all of the physical settings support social activities; Golden Age's spatial properties and built features accommodated few needs of group users. Nevertheless, the consistency still suggests that the three courtyards are programmed as a social space. Some cohesive attention was given to "Safety & security" and "Familiarity". The former is emphasized by the three physical settings and organizations, and the latter is encouraged by staff practice and internal rules of the three courtyards.

Table 8-7. Shared experiential qualities cross the three courtyards

Type of evaluation	Attributes								
	Social Accessible			Sensory	Safety	Awareness &		Meaningful	
	Privacy	inter.	features	stimulation	Security	Familiarity	orientation	Ownership	activity
Physical settings	0	0	+	-	+	0	+	-	0
Organization	-	+	0	-	+	0	0	0	-
S-R* relations	-	+	-	+	0	+	-	-	-
Internal Rules	-	+	-	+	0	+	-	-	+

+ Emphasized attributes (attributes at top and middle rankings across the three courtyards)

— Overlooked attributes (attributes at middle and bottom rankings across the three courtyards)

0 Inconsistent attentions from the three courtyard in an assessment (Attributes at top or bottom rankings in the three courtyards)

* S-R relations: Staff-resident relations

Different levels of focus were found on the four attributes: “Sensory stimulation”, “Information awareness & orientation”, “Accessible space & built features” and “Participation in meaningful activities” across the three settings. More specifically, “Sensory stimulation” was supported by the three courtyards in terms of staff practice and internal rules but omitted in the planning of the three physical settings. “Information awareness & spatial orientation” was facilitated by the three physical settings but compromised by staff practice and user behavior in the three settings. In terms of “Participation in meaningful activities”, activity staff of the three facilities had little training in using natural materials to enhance sense of usefulness and display identities. The organizations did not address this aspect in their goals, outdoor programs nor the policy. The physical settings at the same time were not used as a place to emphasize a positive and familiar feedback loop— gaining and also giving something to environments— very common experience in home gardening.

Residents themselves took action in realizing their own personal rules and principle of gardening. In Silver Life and Elderly Living, although gardening was not encouraged, residents did deadheading, pull

weeds from flowers pots, and even secretly cut down plants they did not like. They attempted to make the courtyard and their life more meaningful and significant with little organizational and staff support.

One potential reason to cause different levels of focus is that in each of the courtyards, there may be something missing in translation among architectural programming, functional (activity) programming and desired goals; in other words, there is a lack of common language in communication or inadequate consensus in planning, designing, and managing the space among different social roles of the courtyards.

Two attributes: “Privacy” and “Sense of ownership”, which involves residents’ control of environments were neglected in unanimity. A lack of privacy may suggest a mindset of how the organizations struggle between safety and autonomy (self-control of personal information); to make surveillance easier, autonomy was compromised by making the courtyards as open as possible. Residents were obviously not the decision-makers and gardeners of the three courtyards. Given a top-down management, few opportunities were provided to allow meaningful engagement and personalization. The three administrators still insisted upon executing their influence in the courtyards—a space generally assumed as the least institutional and the most home-like settings in a nursing home.

III. Successful and Unsuccessful Cases

To understand which case is more successful than the others, a radar chart is created to understand which courtyard has equal emphases on the nine attributes (Figure 8-1). The plot is developed based on each courtyard’s average ranking score from the four assessments. For example, Silver Life ranks number one in all the four evaluations regarding “Social interaction”; if getting ranked number one receives three points (ranking number two, two point; ranking number three, one point), Silver Life’s average ranking score of the four evaluations will be “three” under “Social interaction”.

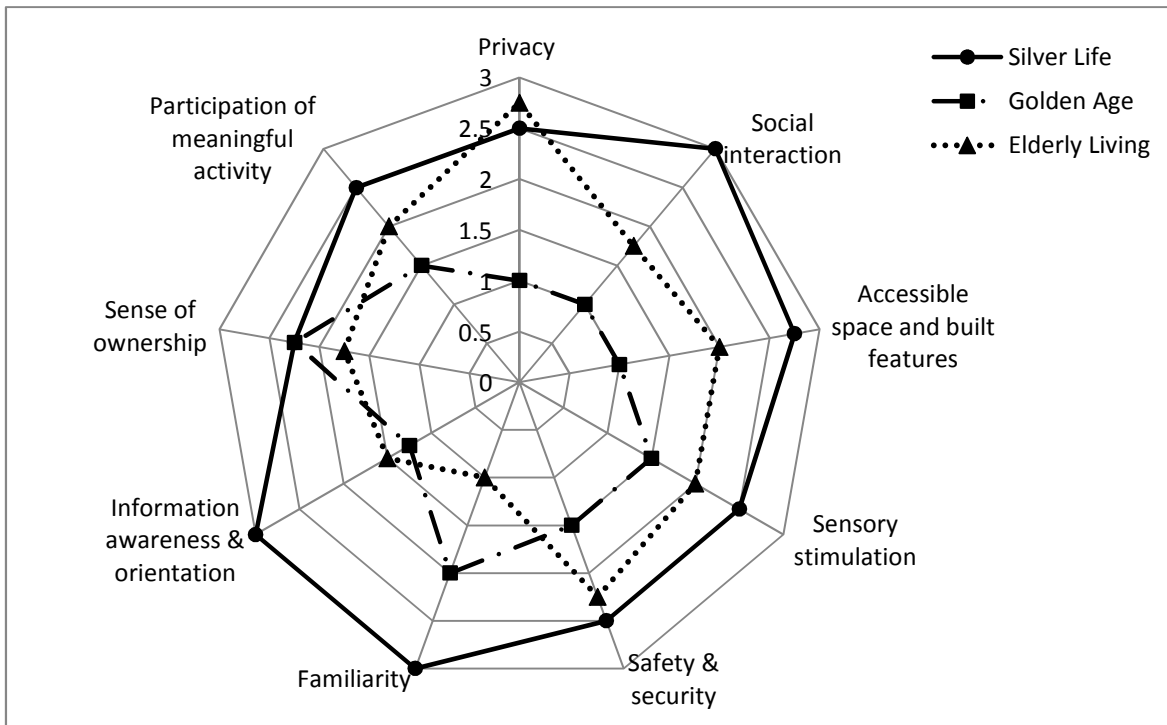


Figure 8-1. Average ranking scores of the three courtyards in the nine attributes

Social Interactions in Silver Life

Overall, Silver Life’s courtyard outperformed other two cases in most of the attributes. Its “Social interaction”, “Familiarity” and “Information awareness & orientation” were particularly outstanding. As discussed in the previous sections, “Social interaction” in Silver Life was supported collectively by the organization, physical settings, staff practice and internal rules. Different types of social activities were well accommodated and facilitated. Chapter 7 disclosed that the courtyard constantly had “people out there” talking to others or enjoying outdoor views (

Figure 8-2). One major reason that the courtyard remained social is that it served as 1) a shortcut between corridors, 2) a place for family gatherings and 3) a room for outdoor activities. More specifically, there are many staff and family passing through during the day in the summer months; they gave “unobtrusive surveillance” while greeting residents or just strolling through the courtyard. Family

members liked to bring residents to the courtyard for fresh air and sunshine, and adequate and comfortable furnishings accommodate family picnics or cook out parties. Therefore, there are many spontaneous interactions triggered between residents, family members and staff passersby.

Staff would encourage residents to have lunch, read a book or just sit and relax at the courtyard; once residents visited courtyard, they would have higher probability of talking to people and exchanging information regarding the facility and community. Through interacting with others, residents may thus have a better awareness of time or seasonal activities and better connection with the surroundings. In this regard, the courtyard satisfies desires of finding out “what’s new around the world?” and help residents map themselves in relationships with family, friends and communities. “Familiarity” and “Information awareness & orientation” are thus enhanced. For example, Jane received a message in the courtyard that one of the residents passed away few days ago. She complained that the facility concealed the information because she wanted to say goodbye to her and express condolences.

The above description represents interactions between three sets of place rules: “People out there”, “Unobtrusive surveillance” and “What’s new”; they are the center of the pattern in Silver Life’s courtyard (Figure 8-2) (see also Figure 7-4 in Chapter 7), making the courtyard become a social place.

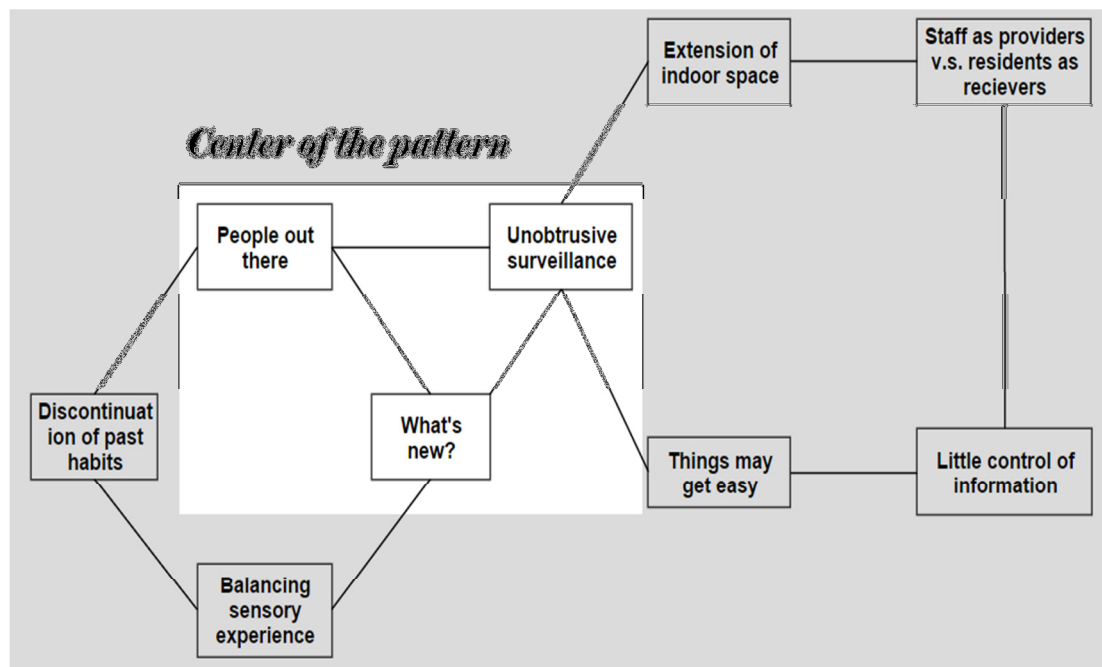


Figure 8-2. Patterns that enhances social interactions, familiarity and awareness & orientation

Sense of ownership in Golden Age

The courtyard at Golden Age fell behind with many aspects. However, its “Sense of ownership” was especially outstanding because residents had some opportunities of making decisions and personalizing outdoor activities. In this courtyard, a process of personalization was related to action of “showing some personalities” or realization of personal rules. The action was related to sets of rules about “meaningful and familiar engagement” and “Not a necessary care component” (Figure 8-3) (see also Figure 7-8 in Chapter 7). More specifically, given little organization’s and staff’s attention, residents were able to take partial control of the courtyard. For example, garden space in the courtyard was not weeded regularly; some residents got rid of weeds whenever they felt necessary. The gardening process not only enhanced their past social role as a gardener and usefulness but also actualized their own aesthetic rule of a garden. Another example is that the courtyard was poorly furnished due to a shortage

of budget. Any donation was welcomed. Residents were allowed to put their own furniture in the courtyard and encouraged to share it with others. One resident brought his lounge chair; it has been used by courtyard visitors. In other words, the courtyard makes personalization meaningful in a way that helps the organization to accommodate activities.

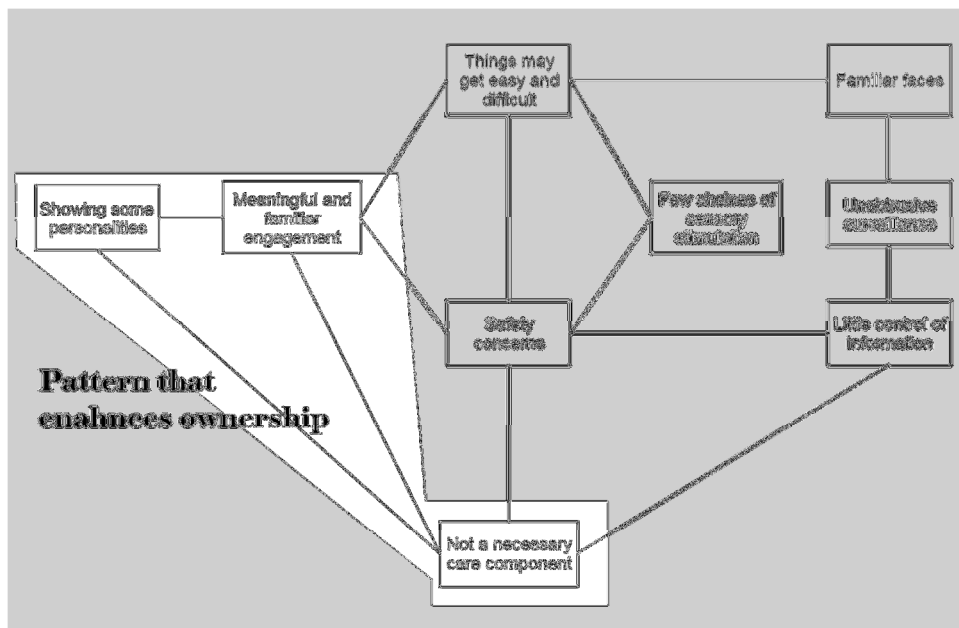


Figure 8-3. Pattern that enhance sense of ownership

Privacy in Elderly Living

Elderly Living steadily remains between the two cases in most of the facets. It stands out because of its support of “Privacy”. When the weather was permitting, courtyard users had no need to crowd under the tree shade; people had more control of the flow of personal information by sitting in the pergola or arranging chairs to a corner that is less visible or away from mainstream foot traffic. In that case, courtyard users have adequate personal space to prevent private conversation from being overheard.

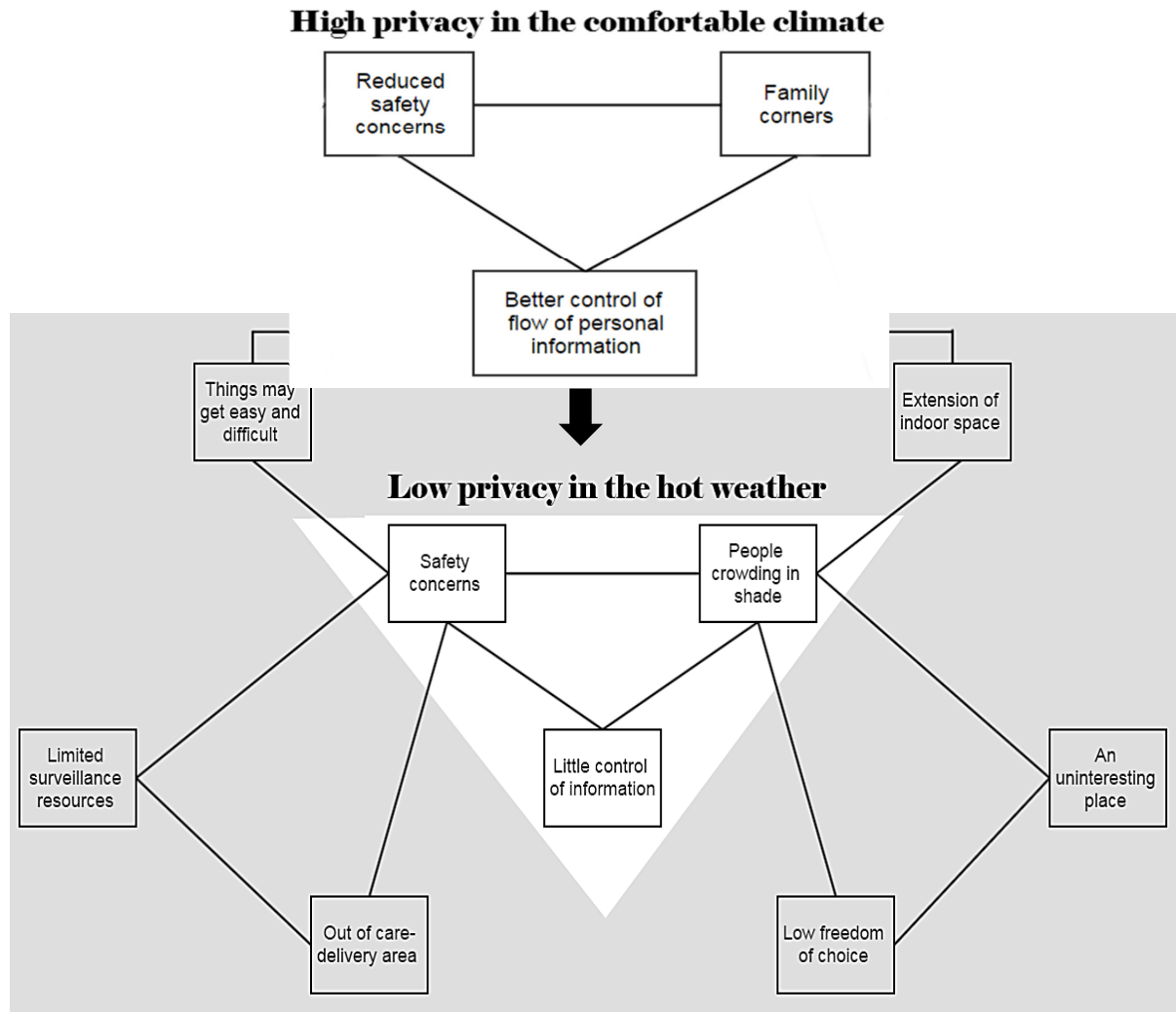


Figure 8-4. Pattern that enhances or compromise privacy

However, the weather was very extreme in the summer months. When people competed for tree shade, the courtyard was characterized by interactions between three rule sets: “people crowding in shade”, “safety concerns”, and “little control of information” (Figure 8-4) (see also Figure 7-12 in Chapter 7). After the only one pergola was occupied, individual and groups users started staying in tree shade, and personal distance became shorter. Since there was no defined section for social gatherings, family members sat wherever the shade was (e.g., path intersections, lawn or entries of patios). They sometime blocked the paths and thus created behavioral conflict with a resident who wandered around

the courtyard. If more shade device can be provided, privacy levels and behavior conflicts may be improve.

CHAPTER 9 : DISCUSSION

This chapter reviews key concepts in terms of theory, methodology and practice implications in the previous eight chapters. Characteristics of these concepts form bedrock of discussion for trustworthiness and limitation of this study. Following that is the discussion of implications for future research and reflection in programming.

I. Discussion of Theory, Methodology and Practice

This study demonstrated a pragmatic approach to understanding relationships between nursing home courtyards and their participants. Philosophically, it was guided by Pragmatism, a worldview that attempts to move toward the middle from the left and right. Knowledge is the knowing of the world through its workability. Forms of knowledge are consensual and pattern-based understanding of constructed realities. In terms of theory, this study was guided by systemic place theories, which comprises both holistic and interactive worldviews of people-environment relations. A mixed research method was applied to capturing the multi-faceted phenomenon. Following these premises, this dissertation research offers a new perspective on institutional of outdoor environments. A nursing home courtyard is conceptualized as a pragmatic place. The pragmatic place is experiential in nature and is associated with a research model “Professional activity as disciplined inquiry” (Figure 3-2) (Fishman, 1999, p. 11), which attempts to merge boundaries between theory and practice. Findings of this study aim at helping reformulating ineffective outdoor projects and also expand theoretical discussion of institutional outdoor settings.

A. A pragmatic place

Based on the study of James (1975), Polkinghorne (1992), Fishman (1999), Canter (1977; 1991) and Weisman (2001), the nursing home courtyards as a pragmatic place have the following features:

1) Social construction:

A pragmatic place is formed among different social roles with socially-shared values. The socially-shared values are “social logic of space” (Canter, 1991, p.198), which results from “socially negotiated expectations of what happens in places” (Canter, 1986, p. 219). According to Canter (1986), negotiation exists because people (or different social roles) have different goals of place use. Conflict interests are created when people want to make sense of place in their own way. Once it is negotiated, Canter believed that the ordering of space becomes stable and acts as agreement between social roles, guiding behavior.

A nursing home courtyard is constructed with a consensual knowledge among organizations, staff members, family members, residents and other roles. These different social roles act upon environments to seek satisfaction of life. However, unlike what Canter perceived, the three courtyards are dynamic and remain in negotiating process. For example, a resident in Elderly Living asks for more autonomy in the courtyard. He loves birdwatching and found no birdhouse or birdfeeder in the courtyard. He wrote to the administrator and requested to install his own birdfeeder stand. Although the idea was approved, to keep a neat and clean environment the birdfeeder was turned to face the lawn rather than the patio to prevent food from dropping on the paved floor. The resident turned it back whenever he discovered the birdfeeder was not oriented in the way he likes. His purpose is to make the birdfeeder visible from the patio so people can watch birds eating food. The negotiation was carried out every day during the observation period. To the organization, control over a birdfeeder may ensure clean and neat environments. The control increases marketing values of the courtyard and prevent the organization’s authority from being challenged. However, to the resident, his action is just to make more sense of his life.

2) *Instrumental value:*

A pragmatic place centers practical or pragmatic usefulness in particular contexts. From James' perspective, the practical usefulness is linked with satisfaction of things, work security and efficient laboring. A pragmatic place thus focuses on how well a place cope with things rather than representations of intrinsic natures. Each of the three nursing home courtyards reflects unique instrumental meaning in its context. For example, the courtyard in Silver Life is programmed as a relaxing and less restrictive social space. The atmosphere helps reduce an institutional image of the facility or create a home-like ambiance. Residents' safety is mainly maintained by staff passersby who use the courtyard as a short cut. However, such surveillance is made irregularly. To ensure residents' safety, passive use of the courtyard (e.g., talking, observing nature and reading) is preferred; the mindset of passivity or overprotection may prevent falling and avoid potential litigation. The model has been run for many years since the administrator received some positive feedback. However, activity staff who have direct interactions with residents struggle between overprotection (or safety) and autonomy. They sometime, on behalf of the residents, negotiate with the administrator for more decision-making opportunities. The model applied in Silver Life may not fit the other two cases. Issues of budget shortage in Golden Age and a strong top-down leadership style in Elderly Living may drive them to move to different implementation.

3) *An experienceable system:*

Following Weisman (2001), the pragmatic place is perceived as a system comprising different subsystems. These subsystems interact with each other and shape the system as a whole. Weisman's concept of place focuses on interactions of three sub-systems: physical settings, people and programs. Place experience, a synthetic concept of five psychological processes of environments (or what Weisman called "modalities"), results from interactions among the three subsystems. Place experience thus has

both monistic and pluralistic properties because all things converge in experience, while segmented contexts are perceived at the same time (Lamberth, 1999).

To Weisman, place experience is essence of a place, serving as a unit of study for research on people-environment relations. With the unit of study, pragmatic environmental evaluation is to understand whether there is “good” experience of a place. The good experience is built on shared desirable experience that different social roles seek to. In this study, shared desirable experience of nursing home courtyards is attributed by nine experiential features. Each studied case has a unique compound of the nine attributes; the compound serves as an identification mark telling the courtyard’s personality. Silver Life shows a dominant experience of “Social Interaction”, “Information awareness and spatial orientation” and “Familiarity”. Golden Age displays a strong “Sense of ownership” and “Familiarity”. People in Elderly Living may feel senses of “Privacy” and “Safety & security”. Each unique compound suggests a particular arrangement of the three subsystems; the arrangement conveys experience and meanings.

B. Synthesis of data from a mixed research method

As discussed in the above section, the pragmatic place has both physical and phenomenological quality. Both qualitative and quantitative research methods were applied to understanding the multiplicity. Synthesis of different sources of data relies on transformation of data into experiential qualities (Figure 9-1).

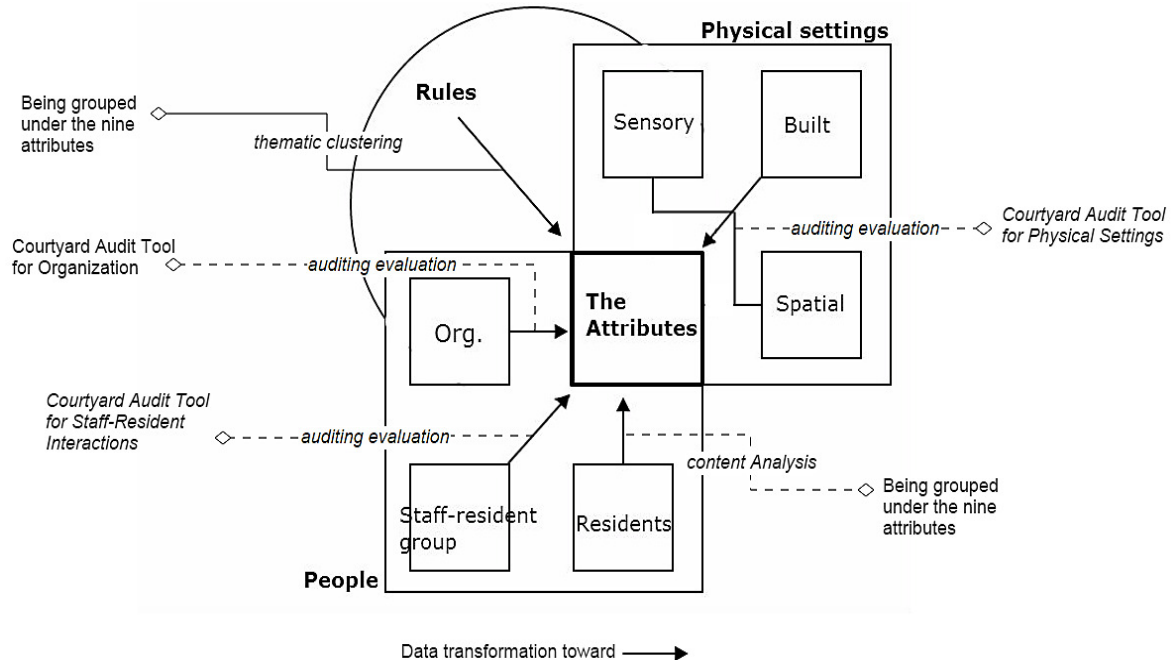


Figure 9-1. Transformation of data

To understand characteristics of physical settings, several techniques were employed to analyze sensory, spatial and built features. Two software tools, NodeXL and UCL Depthmap, helped translate spatial relationships into graphs of spatial networks and graphic metrics. Two software programs, ImageJ and Image Color Summarizer, analyzed color palette of the three courtyards in terms of a HSB histogram. Devices like a sound level meter, a handheld travel anemometer and two outdoor thermometers were employed to measure auditory experience, senses of pressure and thermal comfort respectively. The data was analyzed using descriptive statistics. Built features were inventoried. The number of furniture, structure and infrastructure suggests levels of affordance of each courtyard in accommodating different activities. These quantitative approaches added in objective understanding of physical contexts and serve as a foundation of reflective descriptions of environments.

To assess supportiveness of physical settings in the nine attributes, the courtyards were evaluated using the Courtyard Audit Tool for Physical Settings (Appendix G). As discussed in Chapter 5, the tool attempts to transcend subjective-objective dichotomy.

The same process was applied to collect data of the “people” sub-system (Figure 9-1). Organizational and staff resources were quantified using Moos & Lemke’s (1994) Policy and Program Information Form (POLIF) as well as Resident and Staff Information Form (RSIF) (Appendix H). The data serve as useful background information in evaluations of the courtyard using the Courtyard Audit Tool for Organization (CATO) (Appendix J) and the Courtyard Audit Tool for Staff-Resident Interactions (CATSI) (Appendix K).

Residents’ profile includes demographic data and also their interviews of home garden/gardening experience. The former information aids in understanding of content analysis of resident interviews. Several thematic topics emerging from the analysis were grouped by the nine attributes. Comparisons of frequency of the topics in each attribute revealed what attributes were emphasized in home-garden/gardening experience. Internal rules came up from behavior observation and field notes. Similarly, they were categorized and grouped by the nine attributes. Each rule was evaluated regarding its positive or negative impacts on an attribute the rule was assigned to. An attribute with more positive and less negative rules is viewed as a dominant experience of the courtyard shaped by its rule system.

Given the transformation of the data, the three courtyards are ready to be compared and contrasted. Metaphorically speaking, they now speak the same language—experience—to tell their stories.

C. Theory and practice: two sides of the same coin

This research demonstrates an example that theory and practice are interdependent on each other. The interdependent relationships is illustrated in the model of “Architectural practice as research”

developed in Chapter 2. The model is developed based on Fishman's concept of "Professional Activity as Disciplined Inquiry (Figure 3-2) (Fishman, 1999, p. 11). Steps of Fishman's model are re-labeled to better capture processes of this research (Figure 9-2).

Provision of an intended outdoor space in nursing homes may be driven by several reasons including the trend of nature-based outdoor recreation starting in 1960s, initiation of the Omnibus Budget Reconciliation Act (OBRA) of 1987, and increase of marketing values in competition with other types of long-term care facilities (e.g., assisted-living) after 1986. Chapter 1 has detailed these discussions. Academically, research on environmental psychology and environmental gerontology also followed the direction and provided correspondent discussions. Rachel Kaplan's research on psychological benefits of an outdoor challenge program (1974) and home-gardening activities (1973a) are classic examples during that period of time. The most representative theory, Attention Restoration Theory, was developed by Rachel Kaplan and Steven Kaplan (1989) to theorize benefits of interactions with nature.

Their studies serve as foundation of Ulrich's (1984) research on benefits of green space in healthcare settings. Ulrich argued that views of green space will lead to improvement of physical and psychological outcomes. He also discussed the role of nearby nature in increasing marketability and saving medical costs (Harris et al., 2002; Sadler, 2001; Ulrich, 1999; Whitehouse et al., 2001). Around the same time, the OBRA initiated changes from a medical model to a model with imagery of home (Cutler & Kane, 2005). Several environmental gerontologists participated in this culture change. Lawton played a leading role. His followers like Weisman, Zeisel and Regnier also put a great amount of efforts in research and practice to seek a holistic approach to housing for the elderly. A designed courtyard or garden space has been emphasized in their schemes for improving quality of life in long-term care facilities; however, outdoor space is not their major focus. Current design application of nursing home outdoor environments (e.g., Brawley, 2007; Lovering, 1990) is mostly influenced by research built on

Ulrich's work on hospital settings—which looks for a universal explanation between people and nature rather than holistic knowledge of seeing outdoor environments as a part of care programs.

In 1980s, nursing homes started allotted space for courtyards, patios and gardens (Cohen-Mansfield, 2007). However, about 10 years ago, scholars started to review outdoor programs and settings and revealed several issues including a low visit rate and safety concerns. This dissertation research is inspired by these issues; it aims at improving outdoor environments of nursing homes by 1) understanding and evaluating different cases, 2) identifying an outstanding model and comparing it with less successful one. This research may be viewed as the step of “Monitoring/Evaluating courtyards” in the model of “Architectural practice as research” (Figure 9-2). It is guided by systemic theories and heavily based on literature review and researcher's past experience to develop assessment tools. Conclusion of this study may help reformulation of outdoor projects, and, at the same time, to complement current research on institutional outdoor environments, which is dominated by a positivist approach.

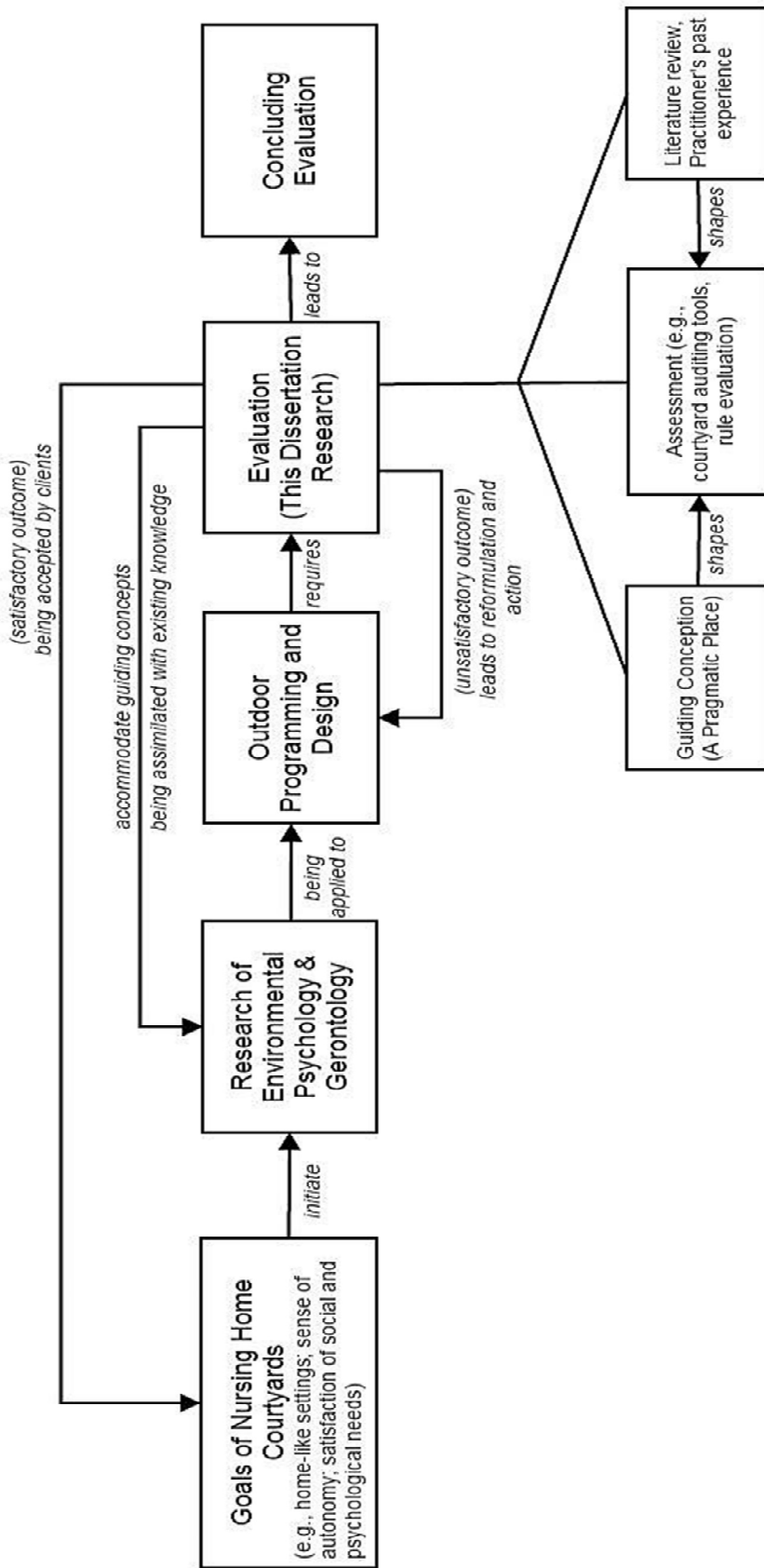


Figure 9-2. Architectural research as practice II

II. Validity, Applicability and Reproducibility

Following Fishman (1999), trustworthiness of this study is discussed in terms of validity, applicability and reproducibility. From Lincoln and Guba's (1985) perspective, trustworthiness of qualitative research is related to a basic issue of "how can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?" (p. 290) Four major criteria of trustworthiness include credibility, transferability, dependability and confirmability (Lincoln & Guba, 1985). Maxwell (1992) developed another system to evaluate qualitative research (i.e., interpretive validity, theoretical validity, generalizability and evaluative validity). Fishman (1999) integrates these ideas with positivist concepts of validity and reliability. His purpose is to address quality of functional effectiveness or workability of a pragmatic study.

Construct validity

According to Maxwell (1992), construct validity is "the validity of the concepts (or categories) themselves as they are applied to the phenomena" (p. 291). In a pragmatic study, construct validity aims at establishing valid performance indicators in measuring clients' program process and program goals. In other words, it is about validity of conceptual construct applied to a program and also about reasonable, coherent and socially-significant measures (Fishman, 1999).

This study is to understand place experience of nursing home courtyards or what nursing home courtyards feel like. Pragmatically speaking, it is to reveal what desired experiential attributes is created in outdoor programming of nursing home courtyards. "Place experience" has been used by systemic scholars to describe people-environment relations holistically. It is treated as essence of a place and perceived as evaluative. Different combinations of desired experiential attributes suggest different degrees of satisfaction or effectiveness of a program's process and goals. Norris-Baker, Weisman, Lawton, Sloane & Kaup's (1999) study in assessing 20 special care units for dementia is an example displaying the concept. In Moore's study (Moore, 2000), hidden programs of three adult day care

facilities are linked with five experiential attributes: control, sociality, orientation, stimulation and adaptability. A facility that has more patterns with positive relationships with the attributes is deemed as more successful.

Comparison of different place theories is presented in Chapter 3. It discussed importance of applying a middle-ground theoretical approach—the systemic concept—to this research. The discussion provides theory triangulation in interpretation of the phenomenon of the courtyards. These different theories although paradigmatically diverse comprise similar discussions of tangible and intangible factors shaping or being unseparated from place experience. Table 3-4 in Chapter 3 shows comparison of theoretical categories between studies of Barker (1968), Moos (1981), Canter (1977, 1991), Cresswell (1996), Weisman (1997, 2000) and Casey (Casey, 1997, 2009). Weisman (1997) grouped these factors into three sub-systems: physical settings, people in place and programs (implicit and explicit rules). These works serve as starting points that inherit the past and usher in the future. Following these studies would ensure measures or descriptions do not differ from the usual ways these terms have been studied. This study is thus built on shared construct validity among the previous research.

Validity within the study

The discussions of validity within the study comprise two concepts: “internal validity” and “credibility”. To establish credibility, continuous engagement is one of strategies (Lincoln & Guba, 1985). In this study, behavior observation was conducted for at least six continuous days and over 41 hours in each case. Observation stops when various mapped behavior repeated with predictable regularity. The observation helps identify features most relevant to the usage of the courtyards and aids in developing explanation extensively (Lincoln & Guba, 1985). Another strategy is method triangulation using multiple methods (e.g., software analysis, behavior observation, interviews and field notes) to create cross-verification from more than two data sources.

Fishman (1999) viewed “internal validity” as “internal-functionality validity”, which “involves the establishment of pragmatically useful, functional relationships between program intervention variables and client outcome variables.” Although findings of this study are not triggering changes yet, the material is pragmatic in a way that has identified a relatively successful case, and compared it with a less effective one. Its ultimate goal is to help a nursing home facility to plan, design, implement, evaluate and document an outdoor programming. To improve the courtyards, the three facilities may start with defining desired experiential attributes in linking outdoor activities. This may be followed by re-developing their activity programming to correspond to the defined desired attributes. This process may require re-examining profile of residents, strategies of delivering activities, and goals and contents of activity programs. Their architectural programming can be reviewed in the same vein. The physical settings should accommodate several aspects in responding to defined attributes of place experience.

Applicability to other courtyards

Applicability of this study is decided by its transferability (Lincoln & Guba, 1985). Contexts of each courtyard in this research are perceived as different and complicated. It is impossible to conduct hypothesis testing and representative sampling that are usually carried in quantitative research. To increase higher probability of making the findings more significant to other cases, this study provides detailed descriptions of the contexts: physical settings, organization, staff resource, resident profiles and internal rules of place use of the three cases. The purpose is to allow readers to decide the extent that the findings can be transferred to other cases based on their needs and situations. In other words, the applicability is determined by users rather than researchers (Fishman, 1999; Speziale et al., 2011).

One thing that Lincoln and Guba did not address is the issue of what and how much detail should be conveyed to readers? From a pragmatic perspective, a pattern-based understanding of contexts may help decide transferability between cases. A pragmatic assumption is that the world may be filled with radical changes and disorder, but people (individuals, groups and organizations) look for

certainty and select contexts with familiar and workable schemes. It is a pragmatist's responsibility to not only give a "thick description" of cases (Lincoln & Guba, 1985) but reveal their "schemes" to maximize applicability.

Reproducibility of the research process: dependability and member checking

This study takes into account concepts of "reliability" in quantitative measure and "dependability" in qualitative research. This study assumes that objective measurement such as graph metrics of spatial properties is repeatable while it also assumes that data related to people and rule components is impossible to remain stable and unchanged. For example, contents of residents' reminiscence of home-garden/gardening experience may change with their levels of cognitive impairment. According to Lincoln & Guba (1985), within the ever-changing context, both tracked and trackable factors need to be documented so readers can make judgement and understand what potential factors are linked to the change and interpretation. Following that, this study described organizational contexts (e.g., mission and policy), staff resources (e.g., staff-resident ratio and education opportunities) and resident profile (e.g., MMSE scores and mobility level). The background knowledge serves as foundation of understanding settings where changes occur. It also helps foresee a trend of changing. For example, if staff turnover rating is high in a facility, there may be an anticipation regarding changes of staff-resident interactions in a follow-up study.

Another aspect of reproducibility emphasized in this study is consensus of reality (similar with ideas of inter-rater reliability). To pursue socially constructed truth rather than objective reality, one strategy applied is that interpretation and analysis is based on consensual knowledge across previous research. In other words, this study is culturally and historically placed on shared views of nursing home courtyards to ensure consistency. Another strategy is member checking. Two means are employed. First, views of the administrators, activity directors and staff were included in auditing evaluation and descriptions of environments. Consensual and different perspectives between the researcher and staff

members were discussed, allowing readers to judge interpretation that were made. Second, interviews with these members were scheduled after resident interviews and behavior observation. Their participation facilitates and confirms interpretation of residents' behavior and experience. Besides, interim data analysis was reported to administrators, activity director and/or staff of the three nursing homes. The activity director and staff in Silver Life accepted the interpretation of place experience and experiential attributes; they felt that the findings can guide design of activity programs and serve as information in negotiation with the administrator for more resident's autonomy in the courtyard. They were interested in results of content analysis of resident interviews in particular. After the report, staff started to review inadequacy of outdoor programs in providing gardening activities. The administrator had different interpretations of ownership created in the courtyard. She perceived residents as customers and herself as a service provider, who take responsibilities to maintain environments for activities.

The administrator and activity staff in Golden Age accepted the interpretation of their courtyard but showed pessimistic attitudes toward future improvement; they argued that the low performance of the courtyard is caused by little financial support, and it is very difficult to them to change the financial hardship. The administrator and activity director of Elderly Living gave the least feedback. They did not disagree with or accept the interpretation of the data. They expressed that they quite satisfied with what the courtyard is now. The activity director argued that the unpredictable weather conditions and shortage of activity staff are major reasons to limit experience and participation in the courtyard.

The member checks suggested that "place experience" is a simple and direct concept in communication with staff. It is meaningful and understandable to healthcare and activity professionals and facilitates discussion of contexts (people, physical settings and rules) in future improvement. Comments made by the staff were addressed. Their feedback helps describe the organizational culture and staff attitudes of this study.

III. Limitations of This Study

Limitations of this study are concerned with 1) a lack of existing case reports for comparison, 2) requirement of multidisciplinary approach and 3) issues of method and measurement. The first point is concerned with underdeveloped pragmatic cases studies on institutional outdoor environments and the rest of the topics are about limited resources in dealing with multi-faceted phenomenon.

A. A lack of existing case reports

One major attempt of this study is to make a multiple-case comparison. The purpose is to select a relatively successful model for guiding a less effective case. As discussed in Chapter 8, Silver Life's courtyard outperforms the other two cases. However, it is unable to know how effective it is as compared with other outstanding courtyards; it is unclear whether there are shared qualities between Silver Life and other successful cases. One major reason is that there are very few case-driven studies or case reports of institutional outdoor environments. Most of the previous research is embedded with an interactive worldview and causal relationships between behavior and environments. Few studies applied a systemic approach to multiple cases.

Another reason is an absence of evaluation tools. If there is an agreed-on tool among scholars and if different case studies are evaluated using the same tool, comparisons will be allowed on the same ground. Current environmental assessment tools such as TESS-2+ (Therapeutic Environment Screening Scale) (Sloane et al., 2002) and PEAP (Professional Environmental Assessment Protocol) (Weisman et al., 1993) emphasize institutional interior environments. One published tool for outdoor settings, the Alzheimer's Garden Audit Tool (AGAT) (Marcus, 2007b), has not yet been widely tested. The tool mainly serves as a checklist of outdoor physical settings and overlooks organizations and staff practice. Since a nursing home courtyard is viewed as a holistic system in this study, the tool does not quite meet the need. Three auditing tools were developed and applied in the study for a more complete assessment.

Values of the tools may be enhanced as they are continuously tested and revised. A cumulative database of documented cases using the same tools may generate information regarding shared features among successful or less successful models.

B. Requirement of multidisciplinary approach

A nursing home courtyard is a system comprising different sub-systems. At the same time, the courtyard itself is a sub-system of a facility, interacting with other sub-systems like dining rooms, kitchens, activity rooms, therapy spaces, nursing stations, offices and other indoor spaces. Understanding relationships with these sub-systems helps describe a courtyard space and defines a nursing facility as a whole. A cross-subsystem study requires intellectual work both within and across disciplines; however, this study is unable to deal with such research scope due to limited resources. One example that needs collaborative research was found in both Silver Life and Golden Age. Residents were found to save bread or hamburgers to feed wild birds. Silver Life later prohibited the behavior due to maintenance issues. The feeding behavior may suggest a particular interaction among three sub-systems: the courtyard, kitchen and dining room. Previous scholars have found that nursing home residents have little control of their meal size and ingredients; mismatch between resident and dietitian expectation may cause food uneaten or returned (Les Clarke, 2009; Wright et al., 2013). Furthermore, the way staff manage leftover food may violate food ethic of older adults who experience food insecurity. Studies have revealed that residents like to save and hide leftover food (Deutschman, 2005; Roseman, 2007). Feeding birds in the courtyard may be a way to reduce waste of meals; however, it causes maintenance problems and attracts insects but putting a ban on feeding birds gives little help in understanding dynamics between nutrition intake, food delivery and outdoor activities. To understand the complex, multiple-disciplinary research will be necessary.

Another example is concerned with integration of indoor and outdoor rules. The two systems should not be separated as different phenomena because residents' use of courtyard space is

continuous action starting from leaving their bedroom. Residents' indoor behavior can be traced by continuous observation in which well-trained observers pick residents and map indoor-outdoor behaviors for a period of time. By combining outdoor with indoor observation data, a more complete picture of indoor-outdoor rules may be established.

Such collective work not only increases validity of research (conceptual and method triangulation) but also generates consensual knowledge of place. The consensus is negotiated in nature because different disciplines would bring different worldviews into place. Multiple worldviews ensure "checks and balances" since no one paradigm has a privileged domination in explanation of phenomena (Fishman, 1999). For example, a dietitian may hold a medical model in discussions of residents' leftover food. To staff who provide feeding assistance, the same issue could be associated with an atmosphere of meal environments (e.g., calming-effect music) (Edwards & Gustafsson, 2008; Goddaer & Abraham, 1994). To activity staff, feeding birds using leftover food could be involved with an attempt of maintaining past life style and leisure habits. Architects or architecture researchers may act as cultivators in the process of collaboration or participatory research to generate "common good" in making design decision (Groat & Wang, 2002).

C. Issues of method and measurement

Sampling issues

Sampling issues are related to selection of cases and resident interviewees. A purposeful sampling (Coyne, 1997; Luborsky & Rubinstein, 1995) is applied in two stages of case selection. The first stage considers convenience; it collects many key informants (nursing homes with an intended outdoor space) in a short period time that require less traveling efforts (nursing facilities within 100 miles from City of Milwaukee). Based on satellite images provided from Google Earth, the researcher selected 40 candidates from 114 licensed nursing homes with geographic advantages. The second stage involves sampling that reflects intentions of this study. Through email communication, the researcher was

granted access to 14 nursing homes. Each courtyard is assessed using an evaluation tool for measuring quality of physical settings (see discussion in Chapter 4); three courtyards with high, medium and low scores are selected to correspond to theoretical guidance and enhance pragmatic usefulness. It is assumed that different qualities of physical settings may suggest different levels of organizational and staff attention; variation of place experience may be expected among the three cases. These processes line up with sampling techniques of qualitative research, which is characterized by convenience, researcher's judgement and theoretical concepts (Luborsky & Rubinstein, 1995). Since each courtyard is viewed as a unique context, it should not be perceived as normally distributed (Marshall, 1996); representative sample and valid inference is thus not a goal to pursue.

This study seeks shared socially-constructed values among the selected cases. The sampling strategies would make its findings become more meaningful when the number and variation of studied cases increases; consensual findings of a significant collection of cases suggest agreed practice in maximizing functional effectiveness in a particular societal context. In other words, such sampling does not limit conclusions of generalizability that can be drawn.

Resident participants for home-garden interviews were not randomly selected either. Nursing home residents have various cognitive and verbal abilities; selection of appropriate resident-interviewees depends on staff's judgment. Residents' past experience, communication skills, and family members' willingness of assigning a consensus form are major criteria. One issue is that staff's attitude may decide the number of participants. Staff in one of the cases were not enthusiastic about the study; few residents were contacted and recommended. Despite that, data of field notes complemented the insufficiency; more days were spent in the facility and courtyard, which helped improve relationships with the field and aided in collecting information from spontaneous conversation and behavior observation.

Challenges of conducting interviews with nursing home residents

One advantage of this study is not only making comparison of place experience between the cases but also between home-garden and courtyard experience. Data of home-garden experience was obtained through one-on-one, in-depth interviews. Several techniques were employed to facilitate reminiscence because most of the residents suffer from some cognitive impairment and have difficulties in recalling things. One basic tactic is leading a 10 to 15 minute “warm-up” time starting conversation related to past life experience which residents are interested in. The process requires a simple inquiry of resident’s background. Once residents get into the conditions of reminiscence, interview questions were raised following topics of conversation. Another tactic is application of visual aids such as pictures or a small flower plot to trigger reminiscence.

However, very few interviews went through all questions and completed within an expected schedule. Some people gave repetitive talks, showed uninterested in home gardens, felt agitated or just withdrew. Others were easily distracted and unable to stay focused. Their minds sometime strayed back to a specific event in the past and were hardly intervened. For example, one resident in Golden Age turned any talks to a bowling game he and his wife participated in; if there were no visual aids to guide the talks, he would continue to detail how they practiced bowling over and over again.

Different strategies were used to prevent exhaustion for both the researcher and interviewees. These means include approaching residents multiple times, having interviews in a less formal setting (e.g., courtyard), and utilizing a mix of visual aids like garden pictures, flower catalog and a real plant.

Challenges of collecting data of sensory properties

There are very few measuring tools describing properties of olfactory, taste and tactile experience. One major reason is that there is a lack of systemic categorization and measurement (Valentin & Chanquoy, 2012), and little attention is paid to physical properties triggering multiple sensory experience. Although institutional outdoor environments are perceived as rich in sensory

stimulation, the evidence to support the concept is no more than reflective statement (e.g., Brawley, 2007; Cohen-Mansfield, 2007; Ousset et al., 1998).

IV. Implications and Future Directions

The above limitations and challenges imply directions of future research. There are three directions emerging from this study worth discussing. They include 1) continuity of research, 2) collection and categorization of case reports, 3) place experience as common language in developing architectural and functional programming.

Continuity of research

This study takes a pluralistic perspective on nursing home courtyards, which supports continuity of the research in both quantitative and qualitative direction. Its exploratory findings may help define a complex of variables and relationships between them. Health professionals who are interested in systemic outcome measures may find the study useful as they are able to picture how different variables interact with each other and how all interactions function as a whole system shaping outcomes. Such study is characterized by pragmatic usefulness because organizational, staff, resident and physical factors are taken into account in understanding contexts of successful patterns in operation. It may complement current research developed from the dominant positivist model, which often investigates impact of single variable (e.g., exposure to outdoor settings) while holding all other variables constant.

On the other hand, results of qualitative analysis of place experience and place rules may serve as principles guiding interpretation of subjective experience of institutional outdoor environments. For example, residents' interviews and behavior suggests home gardens or nursing home courtyards are gendered space. Outdoor space may mean differently to a husband and wife or different social roles. Bhatti & Church (2000) employed a critical perspective to reveal gender power relations in home gardens and concluded that a home garden is a negotiated space between family members. There has been little research on this aspect of institutional outdoor settings; it is unable to know how residents

who had been a mother growing food for family define themselves in facility gardens which only allow staff efforts in gardening. It is also worth discussing how residents who had taken care of all the hard work and fix things in gardens and home interpreted nursing home courtyards in which there is nothing they can do. How do they cope with the situation, identify themselves and redefine meaning of life?

Both directions help describe outdoor environments of nursing homes but their development is built on a pragmatic approach that embrace existence of multiple paradigms.

Collection and categorization of case reports

Generalizability of a pragmatic research relies on accumulation of case reports. Workable patterns or models of outdoor settings will be revealed in shared qualities among successful cases. As mentioned earlier, the premise of establishing a database of cases is a shared evaluation tool. Publishing newly-developed assessment tools and examining existing one helps create consensus among scholars and thus standardize case reports for future collection. The collection may not be limited to nursing home outdoor settings; different place types such as hospitals, assisted living and adult day care facilities can be included. Shared features across outdoor environments of different place types may help describe or categorize institutional outdoor environments. In current research, terms such as “healing gardens”(Marcus, 2003), “therapeutic outdoor space” (Ousset et al., 1998; Pachana et al., 2003) and “Alzheimer’s Garden”(John & Tyson, 1999) have been used to described outdoor space of healthcare and long-term care. These vocabularies, to some extent, reflect preconceived ideologies of a place and create confusion in communication. In this study, some staff thought a garden as an outdoor setting for activity programs but others perceived it as a patch of flowers. The former assumes residents as participants and the latter views them as just spectators. The assumption may shape how outdoor project is programed.

Place experience as common language

This study made an attempt of using the nine experiential attributes as a common ground in understanding different sub-systems of a place and making comparison between the cases. The purpose is to highlight that place experience can serve as a common language in communication between design professional and different social roles or stakeholders of nursing homes. In the process of planning or improving a project, once consensual desired place experience is established from negotiation, functional (activity) programming and architectural programming can be developed in corresponding to the defined experience.

In Pokinghorne's (1992) perspective, experience is a way of knowing. He explained, "Rather than reproductions of clear pictures of the real as it is in itself, human experience consists of meaningful interpretations of the real. These interpretations are chiefly characterized by the ways in which the things that make up the real (physical objects, conceptual categories, other people and the self) can contribute to the accomplishment of purposes..." (p. 150). An ordinary expression in everyday life like "I feel something is good or workable" actually suggests a meaningful and organizing conceptual pattern is running to achieve certain goals and evaluate outcomes. However, such basic and direct statement is often overlooked in design and planning of institutional outdoor environments. Instead, concepts of "benefits" of nature or outdoor settings often guide development of architectural and activity programming. The benefits are usually referred to as positive psychological and physiological outcomes. Undoubtedly, they are important quality indicators involved with cognitive, perceptual and biological processes but they provide little implication for a holistic care and require translation in organizational philosophy, staff practice, activity programs and architectural design. Another issue is that the concept of benefits in planning and designing is founded by quantitative evidence-based design; however, as discussed in Chapter 2, the evidence is insufficient.

Seeking consensual and valid experiential attributes may be a way out to help communication and negotiation between different social roles. They require few translation efforts because they convey direct, simple and ordinary concept and retain practical information.

BIBLIOGRAPHY

- Abramson, L. Y., Garber, J., & Seligman, M. E. (1980). Learned helplessness in humans: An attributional analysis. In J. Garber (Ed.), *Human helplessness: Theory and applications* (Vol. 3, pp. 34). New York: Academic Press.
- Ahn, J., Taieb-Maimon, M., Sopan, A., Plaisant, C., & Shneiderman, B. (2011). Temporal visualization of social network dynamics: Prototypes for nation of neighbors *Social computing, behavioral-cultural modeling and prediction* (pp. 309-316): Springer.
- Alden, A. (2010). Welcome to Remodel/Renovation 2010. *Long-Term Living: For the Continuing Care Professional*, 59(9), S2-S17.
- Alexander, C., Ishikawa, S., & Silverstein, M. (1977). *A pattern language: towns, buildings, construction* (Vol. 2). New York: Oxford University Press.
- Altman, I. (1975). *The Environment and Social Behavior: Privacy, Personal Space, Territory, and Crowding*. California: Monterey.
- Altman, I., & Rogoff, B. (1987). Worldviews in psychology: Trait, interactional, organismic and transactional perspectives. . In D. Stokols & I. Altman (Eds.), *Handbook of environmental psychology* (Vol. 1, pp. 7-40). Toronto:: John Wiley & Sons.
- Altman, I., Werner, C., Oxley, D., & Haggard, L. (1987). " Christmas Street" as an Example of Transactionally Oriented Research. *Environment and Behavior*, 19(4), 501.
- Alvarado, C. J. (2011). The physical environment in health care. In P. Carayon (Ed.), *Handbook of human factors and ergonomics in health care and patient safety* (pp. 237). Boca Raton, FL: CRC Press.
- Appleyard, D. (1969). Why buildings are known. *Environment and Behavior*.
- Appleyard, D. (1970). Styles and methods of structuring a city. *Environment and Behavior*.
- Appleyard, D. (1973). Notes on Urban Perception and Knowledge. In R. M. Downs & D. Stea (Eds.), *Image and environment: Cognitive mapping and spatial behavior*. Chicago, IL: Aldine Publishing Company.

- Atkinson, J. (2009). *Natural ventilation for infection control in health-care settings*. World Health Organization Retrieved from <http://www.ncbi.nlm.nih.gov/books/NBK143274/>.
- Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological bulletin*, 80(4), 286.
- Avorn, J., & Langer, E. (1982). Induced disability in nursing home patients: A controlled trial. *Journal of the American Geriatrics Society*.
- Bakker, R. (2003). Sensory loss, dementia, and environments. *Generations*, 27(1), 46-51.
- Baltes, M. M., Honn, S., Barton, E. M., Orzech, M., & Lago, D. (1983). On the social ecology of dependence and independence in elderly nursing home residents: A replication and extension. *Journal of Gerontology*, 38(5), 556-564.
- Barker, R. G. (1968). *Ecological psychology: Concepts and methods for studying the environment of human behavior*. CA: Stanford University Press.
- Barker, R. G., & Gump, P. V. (1964). *Big school, small school: High school size and student behavior*. California, CA: Stanford University Press.
- Barnhart, S. K., H Perkins, N., & Fitzsimonds, J. (1998). Behaviour and outdoor setting preferences at a psychiatric hospital. *Landscape and Urban Planning*, 42(2-4), 147-156.
- Bartlett, F. C. (1995). *Remembering: A study in experimental and social psychology* (Vol. 14). Cambridge: Cambridge University Press.
- Bartlett, R. (2007). 'You can get in alright but you can't get out': Social exclusion and men with dementia in nursing homes: insights from a single case study. *Quality in Ageing and Older Adults*, 8(2), 16-26.
- Batty, M. (2004). A new theory of space syntax. University College London. Retrieved Oct 15, 2015, from <http://discovery.ucl.ac.uk/211/1/paper75.pdf>
- Becker, H. S. (1990). Generalizing from case studies. . In E. Eisner & A. Peshkin (Eds.), *Qualitative inquiry in education: The continuing debate*. New York: Teachers College Press.

- Bengtsson, A., & Carlsson, G. (2005). Outdoor Environments at Three Nursing Homes: Focus Group Interviews with Staff. In S. Rodiek & B. Schwarz (Eds.), *The Role of the Outdoors in Residential Environments for Aging*. New York: The Haworth Press.
- Bengtsson, A., & Carlsson, G. (2006). Outdoor Environments at Three Nursing Homes. *Journal of Housing for the Elderly*, 19(3), 49-69.
- Benjamin, K., Edwards, N., & Caswell, W. (2009). Factors influencing the physical activity of older adults in long-term care: administrators perspectives. *Journal of Aging and Physical Activity*, 17(2), 181.
- Berg, G., Sarvimäki, A., & Hedelin, B. (2006). Hospitalized older peoples' views of health and health promotion. *International Journal of Older People Nursing*, 1(1), 25-33.
- Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York, NY: McGraw-Hill Book Company.
- Berlyne, D. E. (1971). *Aesthetics and psychobiology*. East Norwalk, CT: Appleton-Century-Crofts.
- Beveridge, C. F. (1995). Regionalism in Frederick Law Olmsted's Social Thought and Landscape Design Practice. In T. O'Malley & M. Treib (Eds.), *Regional garden design in the United States* (Vol. 15). Washington, D.C. : Dumbarton Oaks.
- Beyersdorfer, P. S., & Birkenhauer, D. M. (1990). The therapeutic use of pets on an Alzheimer's unit. *American Journal of Alzheimer's Disease and Other Dementias*, 5(1), 13-17.
- Bharathan, T., Glodan, D., Ramesh, A., Vardhini, B., Baccash, E., Kiselev, P., & Goldenberg, G. (2007). What do patterns of noise in a teaching hospital and nursing home suggest? *Noise & Health*, 9(35), 31-34.
- Bhatti, M., & Church, A. (2000). 'I never promised you a rose garden': gender, leisure and home-making. *Leisure Studies*, 19(3), 183-197.
- Bonnel, W. B. (1995). Staff perceptions of the nursing home group dining activity: Interdisciplinary issues. *Journal of Nutrition for the Elderly*, 14(2-3), 15-26.
- Bonnes, M., & Secchiaroli, G. (1995). *Environmental psychology: A psycho-social introduction*. London: Sage.

Bornstein, M. H. (1984). *Psychology and its allied disciplines* (Vol. 1). Hillsdale, NJ: Lawrence Erlbaum Associates.

Bossen, A. (2010). The Importance of Getting Back to Nature for People with Dementia. *Journal of Gerontological Nursing*, 36(2), 17-22.

Bostock, D. (1999). Aristotle: Critical Assesments. In L. P. Gerson (Ed.), *Aristotle: Logic and metaphysics* (Vol. 1). New York: Taylor & Francis.

Boulding, K. E. (1956). *The image: Knowledge in life and society*. Ann Arbor, Michigan: University of Michigan press.

Bowe, P. (2004). *Gardens of the Roman world*. Los Angeles: J. Paul Getty Museum

Brawley, E. C. (1997). *Designing for Alzheimer's disease: Strategies for creating better care environments* (Vol. 1). New York: NY: John Wiley & Sons.

Brawley, E. C. (2002). Therapeutic gardens for individuals with Alzheimer's disease. *Alzheimer's Care Today*, 3(1), 7-11.

Brawley, E. C. (2007). Designing Successful Gardens and Outdoor Spaces for Individuals with Alzheimer's Disease. *Journal of Housing for the Elderly*, 21(3-4), 265-283.

Brown, J. S. T., & Furstenberg, A.-L. (1992). Restoring control: empowering older patients and their families during health crisis. *Social Work in Health Care*, 17(4), 81-101.

Brunswik, E. (1943). Organismic achievement and environmental probability. *Psychological review*, 50(3), 255.

Brunswik, E. (1955). Representative design and probabilistic theory in a functional psychology. *Psychological review*, 62(3), 193.

Butler, R., & Bowlby, S. (1997). Bodies and spaces: an exploration of disabled people's experiences of public space. *Environment and Planning D*, 15, 411-434.

Caldieron, J. M. (2013). The use of color in the dwellings of the informal settlement “la perla” in san juan, puerto rico.

- Calkins, M. (1988). *Design for Dementia: Planning Environments for the Elderly and the Confused*. Owings Mills, Md: National Health Publishing.
- Calkins, M., Szmerekovsky, J., & Biddle, S. (2007a). Effect of increased time spent outdoors on individuals with dementia residing in nursing homes. *Journal of Housing for the Elderly*, 21(3), 211-228.
- Calkins, M., Szmerekovsky, J. G., & Biddle, S. (2007b). Effect of increased time spent outdoors on individuals with dementia residing in nursing homes. *Journal of Housing for the Elderly*, 21(3-4), 211-228.
- Calkins, M., & Weisman, G. (1999). Models for environmental assessment. In R. B. B Schwarz (Ed.), *Aging, autonomy, and architecture* (pp. 130-140).
- Calkins, M. P. (2001). *Creating Successful Dementia Care Settings* (Vol. 1-4). Baltimore MD: Health Professions Press.
- Calkins, M. P. (2002). Environments that make a difference. *Alzheimer's Care Today*, 3(1), v-vii.
- Calkins, M. P. (2004). Articulating environmental press in environments for people with dementia. *Alzheimer's Care Today*, 5(2), 165-172.
- Calkins, M. P. (2009). Evidence-based long term care design. *NeuroRehabilitation*, 25(3), 145-154.
- Canter, D. (1977). *The psychology of place*. New York: St. Martin's Press.
- Canter, D. (1986). Putting situations in their place. In A. Furnham (Ed.), *Social behavior in context*. Newton, MA: Allyn and Bacon.
- Canter, D. (1988). Action and place: an existential dialectic In D. V. Canter, M. Krampen & D. Stea (Eds.), *Environmental perspectives* (Vol. 1). Hampshire, England: Avebury.
- Canter, D. (1991). Understanding, Assessing and Acting in Places: Is an Integrative Framework Possible? In G. Evans & T. Garling (Eds.), *Environment, Cognition and Action: The Need for Integration* (pp. 191-209). New York: NY: Oxford University Press.
- Carlson, D. L., Fleming, K. C., Smith, G. E., & Evans, J. M. (1995). *Management of dementia-related behavioral disturbances: a nonpharmacologic approach*. Paper presented at the Mayo Clinic Proceedings.

Carpman, J. R., Grant, M. A., & Simmons, D. A. (1986). *Design that Cares*: American Hospital Publishing, Inc.,.

Casey, E. S. (1997). *The fate of place: A philosophical history* Berkeley: University of California Press.

Casey, E. S. (2004). Public memory in place and time. In K. R. Phillips (Ed.), *Framing public memory* (pp. 17-44). University of Alabama Press.

Casey, E. S. (2009). *Getting back into place: Toward a renewed understanding of the place-world (2nd Edition)*. Indianapolis: Indiana University Press.

Castle, N. G., Engberg, J., & Liu, D. (2007). Have Nursing Home Compare quality measure scores changed over time in response to competition? *Quality and Safety in Health Care*, 16(3), 185-191.

Caston, V. (1996). Why Aristotle needs imagination. *Phronesis*, 41(1), 20-55.

Caston, V. (2009). Aristotle's Psychology. In M. L. Gill & P. Pellegrin (Eds.), *A companion to ancient philosophy*. Malden, MA: John Wiley & Sons.

Castro, J. B., Ramanathan, A., & Chennubhotla, C. S. (2013). Categorical dimensions of human odor descriptor space revealed by non-negative matrix factorization. *PloS one*, 8(9), e73289.

Cataldi, S. L., & Hamrick, W. S. (2007). *Merleau-Ponty and environmental philosophy*: SUNY Press.

Chalfont, G. E., & Rodiek, S. (2005). Building edge: An ecological approach to research and design of environments for people with dementia. *Alzheimer's Care Today*, 6(4), 341.

Chang, D. (2002). Spatial choice and preference in multilevel movement networks. *Environment and Behavior*, 34(5), 582-615.

Chapin, M. K. (2008). *Creating innovative places: Organizational and architectural case studies of the culture change movement in long-term care*. (Doctoral dissertation), University of Wisconsin-Milwaukee, Milwaukee, WI.

Chapman, N. J., Hazen, T., & Noell-Waggoner, E. (2007). Gardens for People with Dementia. *Journal of Housing for the Elderly*, 21(3-4), 249-263.

- Cloke, P. J., Philo, C., & Sadler, D. (1991). *Approaching human geography: an introduction to contemporary theoretical debates*: Guilford Press.
- Cohen-Mansfield, J. (2000). Nonpharmacological Management of Behavioral Problems in Persons with Dementia: The TREA Model. *Alzheimer's Care Today*, 1(4), 98.
- Cohen-Mansfield, J. (2004). Nonpharmacologic interventions for inappropriate behaviors in dementia: a review, summary, and critique. *Focus*, 2(2), 288.
- Cohen-Mansfield, J. (2007). Outdoor wandering parks for persons with dementia. [yes, 12/24/2014]. *Journal of Housing for the Elderly*, 21(1), 35-53.
- Cohen-Mansfield, J., Marx, M. S., & Werner, P. (1992). Agitation in elderly persons: an integrative report of findings in a nursing home. *International Psychogeriatrics*, 4(04), 221-240.
- Cohen-Mansfield, J., & Werner, P. (1997). Management of verbally disruptive behaviors in nursing home residents. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 52(6), M369-M377.
- Cohen-Mansfield, J., & Werner, P. (1998a). The effects of an enhanced environment on nursing home residents who pace. *The Gerontologist*, 38(2), 199-208.
- Cohen-Mansfield, J., & Werner, P. (1998b). Visits to an outdoor garden: impact on behavior and mood of nursing home residents who pace. *Research and practice in Alzheimer's disease*, 419-436.
- Cohen, U., & Weisman, G. (1991). *Holding on to home: Designing environments for people with dementia*. Baltimore & London: Johns Hopkins Univeristy Press.
- Collins, C. C., & O'Callaghan, A. M. (2008). The impact of horticultural responsibility on health indicators and quality of life in assisted living. *Horttechnology*, 18(4), 611-618.
- Connell, B., Sanford, J., & Lewis, D. (2007). Therapeutic effects of an outdoor activity program on nursing home residents with dementia. [Resident/org. 04212015]. *Journal of Housing for the Elderly*, 21(3), 194-209.
- Cook, G. C. (2002). Henry Currey FRIBA (1820-1900): leading Victorian hospital architect, and early exponent of the "pavilion principle". *Postgraduate medical journal*, 78(920), 352-359.

- Cooklis, E. (1991). *National Register of Historic Places Registration Form: Greene County Almshouse*. National Park Service Retrieved from <http://gis.hpa.state.il.us/pdfs/200828.pdf>.
- Cooper, B. A., Ahrentzen, S., & Hasselkus, B. R. (1991). Post-occupancy evaluation: An environment-behaviour technique for assessing the built environment. *Canadian Journal of Occupational Therapy*, 58(4), 181-188.
- Cordell, H. K. (2008). The latest on trends in nature-based outdoor recreation. *Forest History Today*(Spring), 4-10.
- Cox, H., Burns, I., & Savage, S. (2004). Multisensory environments for leisure: promoting well-being in nursing home residents with dementia. *Journal of Gerontological Nursing*, 30(2), 37-45.
- Coyne, I. T. (1997). Sampling in qualitative research. Purposeful and theoretical sampling; merging or clear boundaries? *Journal of Advanced Nursing*, 26(3), 623-630.
- Coyne, M. L., & Hoskins, L. (1997). Improving eating behaviors in dementia using behavioral strategies. *Clinical nursing research*, 6(3), 275-290.
- Cranz, G., & Young, C. (2005). The Role of Design in Inhibiting or Promoting Use of Common Open Space: The Case of Redwood Gardens, Berkeley, CA. In S. Rodiek & B. Schwarz (Eds.), *The Role of the Outdoors in Residential Environments for Aging*. New York: The Haworth Press.
- Cranz, G., & Young, C. (2006). The role of design in inhibiting or promoting use of common open space: The case of Redwood Gardens, Berkeley, CA. *Journal of Housing for the Elderly*, 19(3-4), 71-93.
- Cresswell, T. (1996). *In place-out of place: geography, ideology, and transgression*. Minneapolis: University of Minnesota Press.
- Cresswell, T. (2004). *Place: A short introduction*. Malden, MA: Blackwell Publishing.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage Publications, Inc.
- Creswell, J. W., & Clark, V. L. P. (2011). *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: SAGE Publications.

- Cubukcu, E., & Kahraman, I. (2008). Hue, saturation, lightness, and building exterior preference: An empirical study in Turkey comparing architects' and nonarchitects' evaluative and cognitive judgments. *Color Research & Application*, 33(5), 395-405.
- Cutler, L., & Kane, R. (2005). As great as all outdoors: A study of outdoor spaces as a neglected resource for nursing home residents. In S. Rodiek & B. Schwarz (Eds.), *The Role of the Outdoors in Residential Environments for Aging*.
- Cutler, L. J. (2000). Assessment of physical environments of older adults. In R. L. Kane & R. A. Kane (Eds.), *Assessing older persons: Measures, meaning, and practical applications* (pp. 360-379). Oxford: Oxford University Press
- Cutler, L. J., Kane, R. A., Degenholtz, H. B., Miller, M. J., & Grant, L. (2006). Assessing and comparing physical environments for nursing home residents: Using new tools for greater research specificity. *The Gerontologist*, 46(1), 42-51.
- Cutler, L. J., Kane, R. A., & Lussier, J. T. (2008). State Regulatory Trends and Evidence to Inform American Institute of Architects (AIA) Nursing Home Design and Construction Guidelines. http://www.hpm.umn.edu/ltrsourcecenter/research/environmental_PDFs/AIA_Health_Care_Guidelines_Report.pdf
- Dannenmaier, M. (1995). Healing Gardens. *Landscape Architecture*, 85(1), 56-58.
- Davidson, D. (2003). Mental Events. In N. Campbell (Ed.), *Mental Causation and the Metaphysics of Mind*: Broadview Press.
- Davis, S. (1998). Development of Profesison of Horticultural Therapy. In S. Simson & M. Straus (Eds.), *Horticulture as therapy: Principles and practice* (pp. 3-17). New York: The Food Products Press.
- Day, K., Carreon, D., & Stump, C. (2000). The Therapeutic Design of Environments for People With Dementia A Review of the Empirical Research. *The Gerontologist*, 40(4), 397-416.
- Detweiler, M. B., Murphy, P. F., Kim, K. Y., Myers, L. C., & Ashai, A. (2009). Scheduled Medications and Falls in Dementia Patients Utilizing a Wander Garden. *American Journal of Alzheimers Disease and Other Dementias*, 24(4), 322-332.
- Detweiler, M. B., Murphy, P. F., Myers, L. C., & Kim, K. Y. (2008). Does a wander garden influence inappropriate behaviors in dementia residents. *American Journal of Alzheimers Disease and Other Dementias*, 23(1), 31-45.

- Detweiler, M. B., Sharma, T., Detweiler, J. G., Murphy, P. F., Lane, S., Carman, J., . . . Kim, K. Y. (2012). What is the evidence to support the use of therapeutic gardens for the elderly? [yes, 12/18/2014]. *Psychiatry investigation*, 9(2), 100-110.
- Detweiler, M. B., & Warf, C. (2005). Dementia wander garden aids post cerebrovascular stroke restorative therapy: A case study. *Alternative Therapies in Health and Medicine*, 11(4), 54-58.
- Deutschman, M. T. (2005). An ethnographic study of nursing home culture to define organizational realities of culture change. *Journal of Health and Human Services Administration*, 246-281.
- Dovey, K. (1985). Home and Homelessness. In I. Altman & C. Werner (Eds.), *Human Behavior and Environment: advances in theory and research (Volume 8: Home environment)* (pp. 33-61).
- Downs, R. M., & Stea, D. (1973). Cognitive Maps and Spatial Behavior: Process and Products. In R. M. Downs & D. Stea (Eds.), *Image and environment: Cognitive mapping and spatial behavior*. Chicago, IL: Aldine Publishing Company.
- Downs, R. M., & Stea, D. (1977). *Maps in minds: Reflections on cognitive mapping*: Harper & Row New York.
- Dunnett, N., & Qasim, M. (2000). Perceived benefits to human well-being of urban gardens. *Horttechnology*, 10(1), 40-45.
- Eakman, A. M., Carlson, M. E., & Clark, F. A. (2010). The meaningful activity participation assessment: A measure of engagement in personally valued activities. *The International Journal of Aging and Human Development*, 70(4), 299-317.
- Edwards, J. S., & Gustafsson, I. B. (2008). The room and atmosphere as aspects of the meal: a review. *Journal of Foodservice*, 19(1), 22-34.
- Ekerdt, D. J. (1986). The busy ethic: Moral continuity between work and retirement. *The Gerontologist*, 26(3), 239-244.
- ElderWeb. (n.d.). History of Long Term Care. Retrieved Oct 05, 2015, from <http://www.elderweb.com/book/history-long-term-care>
- Eliovson, S. (1986). The Japanese Garden. In S. Kaplan & R. Kaplan (Eds.), *Humanscape: Environments for People*. North Scituate, MA: Ulrich's Books.

- EPA. (1974). EPA Identifies Noise Levels Affecting Health and Welfare. Retrieved April, 2015, from <http://www2.epa.gov/aboutepa/epa-identifies-noise-levels-affecting-health-and-welfare>
- Esser, A. H., Chamberlain, A. S., Chapple, E. D., & Kline, N. S. (1965). Territoriality of patients on a research ward. In J. Wortis (Ed.), *Recent advances in biological psychiatry* (pp. 37-44). New York: Plenum.
- Evans, G. W., Saltzman, H., & Cooperman, J. L. (2001). Housing quality and children's socioemotional health. *Environment and Behavior*, 33(3), 389-399.
- Evans, G. W., & Stecker, R. (2004). Motivational consequences of environmental stress. *Journal of environmental psychology*, 24(2), 143-165.
- Evans, K. (2014). *La Fête Médiévale*. Berline: epubli GmbH.
- Fishbein, M. (1963). An investigation of the relationship between beliefs about an object and the attitude toward that object. *Human relations*.
- Fishman, D. B. (1999). *The case for pragmatic psychology*. New York: NY: New York University Press.
- Fortenbaugh, W. W. (2002). *Aristotle on emotion (2nd Edition)*. London: Duckworth London.
- Forty, A. (2003). The modern hospital in England and France: the social and medical uses of architecture. In A. D. King (Ed.), *Buildings and society: essays on the social development of the built environment*. London ; Boston: Routledge & Kegan Paul
- Francis, M. (1992). The Everyday and the Personal: Six Garden Stories. In M. Francis & R. Hester (Eds.), *The Meaning of Gardens*. Massachusetts: The MIT Press.
- Francis, M. (2001). A case study method for landscape architecture. *Landscape Journal*, 20(1), 15-29.
- Frank, J. (2002). *The paradox of aging in place in assisted living*. Westport, CT: Greenwood Publishing Group.
- Friedenberg, J., & Silverman, G. (2011). *Cognitive science: an introduction to the study of mind*: Sage.
- Garling, T., & Golledge, R. (2000). Cognitive mapping and spatial decision-making. In R. Kitchin & S. Freundschuh (Eds.), *Cognitive mapping: Past, present, and future*. New York: NY: Routledge.

- Geboy, L. A. (2005). *Architecture as a Catalyst for Organizational Change: Facilitating a Person-centered Approach to Care in an Adult/dementia Day Center (Doctoral dissertation)*. University of Wisconsin--Milwaukee.
- Gibson, E. J. (1994). *An odyssey in learning and perception*: Mit Press.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston, MA: Houghton Mifflin.
- Gibson, J. J., & Gibson, E. J. (1955). Perceptual learning: Differentiation or enrichment? *Psychological review*, 62(1), 32.
- Gigliotti, C. M., & Jarrott, S. E. (2005). Effects of horticulture therapy on engagement and affect. *Canadian Journal on Aging*, 24(4), 367-378.
- Gitlin, L. N. (1998). Testing home modification interventions: Issues of theory, measurement, design, and implementation. In R. Schulz, G. Maddox & M. P. Lawton (Eds.), *Annual review of gerontology and geriatrics: Focus on interventions research with older adults (Vol. 18, pp. 190–246)*. New York: Springer.
- Gitlin, L. N. (2000). Adjusting Person-Environment Systems: Helping Older People Live the "Good Life" at Home. In R. Rubinstein, M. Moss & M. Kleban (Eds.), *The many dimensions of Aging* (pp. 41-54). New York: NY: Springer Publishing Company.
- Gitlin, L. N. (2003). Conducting research on home environments: Lessons learned and new directions. *The Gerontologist*, 43(5), 628-637.
- Gitlin, L. N., Liebman, J., & Winter, L. (2003). Are Environmental Interventions Effective in the Management of Alzheimer's Disease and Related Disorders?: A Synthesis of the Evidence. *Alzheimer's Care Today*, 4(2), 85-107.
- Gitlin, L. N., Winter, L., Earland, T. V., Herge, E. A., Chernett, N. L., Piersol, C. V., & Burke, J. P. (2009). The Tailored Activity Program to reduce behavioral symptoms in individuals with dementia: feasibility, acceptability, and replication potential. *The Gerontologist*, 49(3), 428-439.
- Glaser, D. (1999). The Evolution of Taste Perception. In A. Corti (Ed.), *Low-Calorie Sweeteners: Present and Futur* (Vol. 85, pp. 18-28): Karger Medical and Scientific Publishers.
- Glass, D. C., Singer, J. E., & Friedman, L. N. (1969). Psychic cost of adaptation to an environmental stressor. *Journal of Personality and Social Psychology*, 12(3), 200.

- Goddaer, J., & Abraham, I. L. (1994). Effects of relaxing music on agitation during meals among nursing home residents with severe cognitive impairment. *Archives of Psychiatric Nursing*, 8(3), 150-158.
- Golledge, R. (1991). Cognition of Physical and Built Environments. In T. Gärling & G. W. Evans (Eds.), *Environment, cognition, and action: An integrated approach*. New York: Oxford University Press.
- Grant, C., & Wineman, J. (2007). The Garden-Use Model-An environmental tool for increasing the use of outdoor space by residents with dementia in long-term care facilities. *Journal of Housing for the Elderly*, 21(1/2), 89.
- Groat, L., & Wang, D. (2002). *Architectural research methods*. New York: Wiley.
- Groat, L., & Wang, D. (2013). *Architectural research methods (2nd Edition)*. New York: John Wiley & Sons.
- Groat, L. N., & Després, C. (1991). The significance of architectural theory for environmental design research *Advances in environment, behavior, and design* (pp. 3-52): Springer.
- Gubrium, J. F. (1975). Being single in old age. *The International Journal of Aging and Human Development*, 6(1), 29-41.
- Gump, P. (1974). The behavior setting: a promising unit for environmental designers *Issues in social ecology*. Palo Alto: CA: National Press Books.
- Gustafsson, K., Andersson, I., Andersson, J., Fjellström, C., & Sidenvall, B. (2003). Older Women's Perceptions of Independence Versus Dependence in Food-Related Work. *Public Health Nursing*, 20(3), 237-247.
- Gutheil, I. (1991). Intimacy in nursing home friendships. *Journal of Gerontological Social Work*, 17(1-2), 59-73.
- Hall, G., & Buckwalter, K. (1987). Progressively lowered stress threshold: a conceptual model for care of adults with Alzheimer's disease. *Archives of Psychiatric Nursing*, 1(6), 399.
- Hammatt, H. (2002). A world outside. *Landscape Architecture*, 92(5), 74-81.
- Hammond, K. R. (1998). Ecological Validity: Then and Now. Department of Psychology, University of Colorado. Retrieved September, 2014, from <http://www.brunswik.org/notes/essay2.html>

- Hansen, D., Shneiderman, B., & Smith, M. A. (2010). *Analyzing social media networks with NodeXL: Insights from a connected world*. Burlington, MA: Morgan Kaufmann.
- Harper Ice, G. (2002). Daily life in a nursing home: Has it changed in 25 years? *Journal of Aging Studies*, 16(4), 345-359.
- Harris, P. B., McBride, G., Ross, C., & Curtis, L. (2002). A Place to Heal: Environmental Sources of Satisfaction Among Hospital Patients¹. *Journal of Applied Social Psychology*, 32(6), 1276-1299.
- Hartig, T. (2004). Toward understanding the restorative environment as a health resource. Retrieved April 15, from The research centre for inclusive access to outdoor environments <http://www.openspace.eca.ac.uk/>
- Hartig, T., & Evans, G. (1993). Psychological foundations of nature experience. *Advances in psychology*, 96, 427-457.
- Hartig, T., Kaiser, F. G., & Bowler, P. A. (1997). Further development of a measure of perceived environmental restorativeness. *Institute of Housing Research, Working paper*(5).
- Harvey, D. (1989). *The condition of postmodernity* (Vol. 14). Oxford: Blackwell Oxford.
- Harvey, D. (1990). Between Space and Time: Reflections on the Geographical Imagination¹. *Annals of the Association of American Geographers*, 80(3), 418-434.
- Heath, Y., & Gifford, R. (2001). Post-occupancy evaluation of therapeutic gardens in a multi-level care facility for the aged. *Activities, Adaptation & Aging*, 25(2), 21-43.
- Heft, H. (1998). Toward a functional ecology of behavior and development: The legacy of Joachim F. Wohlwill. In D. Görlitz, H. J. Harloff, G. Mey & J. Valsiner (Eds.), *Children, cities, and psychological theories: developing relationships* (Vol. 5). New York: Walter de Gruyter.
- Heft, H. (2001). *Ecological psychology in context: James Gibson, Roger Barker, and the legacy of William James's radical empiricism*. Mahwah, NJ: L. Erlbaum
- Helson, H. (1964). *Adaptation-level theory*. New York: Harper & Row
- Hernandez, R. (2007). Effects of therapeutic gardens in special care units for people with dementia. *Journal of Housing for the Elderly*, 21(1), 117-152.

- Herzog, T. R., Maguire, P., & Nebel, M. B. (2003). Assessing the restorative components of environments. *Journal of environmental psychology*, 23(2), 159-170.
- Hessong, A. (n.d.). The Difference Between Air Temperature in Shade & in Sun. Retrieved April, 2015, from <https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espy=2&ie=UTF-8#q=SFGATE>
- Hillier, B. (2007). Space is the machine: a configurational theory of architecture. Retrieved April, 2015, from <http://discovery.ucl.ac.uk/3881/1/SITM.pdf>
- Hillier, B. (2012). The genetic code for cities: is it simpler than we think? *Complexity Theories of Cities Have Come of Age* (pp. 129-152): Springer.
- Hillier, B., & Hanson, J. (1984). *The social logic of space* (Vol. 1). Cambridge: Cambridge university press
- Himmelboim, I., Smith, M., & Shneiderman, B. (2013). Tweeting apart: Applying network analysis to detect selective exposure clusters in Twitter. *Communication methods and measures*, 7(3-4), 195-223.
- Hockey, J. L., & James, A. (1993). *Growing up and growing old: Ageing and dependency in the life course*: Sage London.
- HoĖlscher, C., BroĖsamle, M., & Vrachliotis, G. (2012). Challenges in multilevel wayfinding: A case study with the space syntax technique. *Environment and Planning B: Planning and Design*, 39, 63-82.
- Holahan, C. J. (1982). *Environmental psychology*. New York: Random House
- Holloway, I. (2005). *Qualitative research in health care*. New York, NY: McGraw-Hill Education
- Holtzschue, L. (2012). *Understanding color: an introduction for designers*. New Jersey: John Wiley & Sons.
- Hoover, R. (1995). Healing gardens and Alzheimer's disease. *American Journal of Alzheimer's Disease and Other Dementias*, 10(2), 1.
- Hunt, K. A. (2012). *The Art of Image Processing with Java*. Natick, MA: A K Peters/CRC Press.
- Hussein, H. (2010). Sensory gardens: Assessing their design and use. *Intelligent Buildings International*, 2(2), 116-123.

- Ibbotson, P. (2002). *Eloise: Poorhouse, Farm, Asylum, and Hospital, 1839-1984*. Chicago, IL: Arcadia.
- Innes, A., Kelly, F., & Dincarslan, O. (2011). Care home design for people with dementia: What do people with dementia and their family carers value? *Aging and Mental Health*, 15(5), 548-556.
- Irvine, K. N., & Warber, S. L. (2002). Greening healthcare: Practicing as if the natural environment really mattered (Reprinted from *Creating a sustainable future: Living in harmony with the Earth*, 2001). [5]. *Alternative Therapies in Health and Medicine*, 8(5), 76-83.
- Ittelson, W. H. (1978). Environmental perception and urban experience. *Environment and Behavior*, 10(2), 193-213.
- Ittelson, W. H., Rivlin, L. G., & Proshansky, H. M. (1970). The use of behavioral maps in environmental psychology. In H. M. Proshansky, W. H. Ittelson & L. G. Rivlin (Eds.), *Environmental psychology: Man and his physical setting*. New York: NY: Holt, Rinehart and Winston
- Iwarsson, S., & Ståhl, A. (2003). Accessibility, usability and universal design-positioning and definition of concepts describing person-environment relationships. *Disability & Rehabilitation*, 25(2), 57-66.
- James, W. (1892). *Psychology, briefer course*. New York: NY: Collier Books.
- James, W. (1907). Pragmatism's Conception of Truth. *The Journal of Philosophy, Psychology and Scientific Methods*, 4(6), 141-155.
- James, W. (1975). *The meaning of truth* (Vol. 2). Cambridge, MA: Harvard University Press.
- James, W. (1976). *Essays in radical empiricism* (Vol. 3): Harvard University Press.
- James, W. (1983). *Essays in psychology* (Vol. 13): Harvard University Press.
- James, W. P., & Tatton-Brown, W. (1986). *Hospitals: design and development*. London: Architectural Press.
- Jannefoo. (2012). Focus stacking with Fiji/ImageJ and Enfuse. Retrieved April, 2015, from <http://www.dpreview.com/forums/post/50059191>

- Jarrott, S. E., & Gigliotti, C. M. (2010). Comparing responses to horticultural-based and traditional activities in dementia care programs. *American Journal of Alzheimer's Disease and Other Dementias*, 25(8), 657-665.
- Jensen, C. R., & Guthrie, S. (2006). *Outdoor recreation in America*. Champaign, IL Human Kinetics.
- John, Z., & Tyson, M. M. (1999). Alzheimer's Treatment Gardens. In C. C. Marcus & B. Marni (Eds.), *Healing Gardens: Therapeutic Benefits and Design Recommendation* (pp. 436-504). New York: NY: John Wiley & Sons, inc.
- Joosse, L. L. (2011). Sound levels in nursing homes. *Journal of Gerontological Nursing*, 37(8), 30-35.
- Kane, R. A. (2001). Long-term care and a good quality of life bringing them closer together. *The Gerontologist*, 41(3), 293-304.
- Kane, R. A., Kling, K. C., Bershadsky, B., Kane, R. L., Giles, K., Degenholtz, H. B., . . . Cutler, L. J. (2003). Quality of life measures for nursing home residents. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 58(3), M240-M248.
- Kaplan, R. (1973a). Some Psychological Benefits of Gardening. *Environment and Behavior*, 5(2), 145.
- Kaplan, R. (1974). Some psychological benefits of an outdoor challenge program. *Environment and Behavior*.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York: Cambridge University Press.
- Kaplan, S. (1973b). Cognitive maps in perception and thought. In R. Downs & D. Stea (Eds.), *Image and Environment* (pp. 63-78). Chicago, IL: Aldine.
- Kaplan, S. (1987). Aesthetics, affect, and cognition: Environmental preference from an evolutionary perspective. *Environment and Behavior*, 19(1), 3.
- Kaplan, S. (1991). Beyond Rationality: Clarity-Based Decision Making. In G. Evans & T. Garling (Eds.), *Environment, Cognition and Action: The Need for Integration* (pp. 191-209). New York: NY: Oxford University Press.

- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of environmental psychology, 15*(3), 169-182.
- Kaplan, S., Bardwell, L., & Slakter, D. (1993). The museum as a restorative environment. *Environment and Behavior, 25*(6), 725.
- Kaplan, S., & Kaplan, R. (1982). *Cognition and environment*. New York: Praeger.
- Kaplan, S., Kaplan, R., & Wendt, J. S. (1972). Rated preference and complexity for natural and urban visual material. *Perception & Psychophysics, 12*(4), 354-356.
- Kaplan, S., & Talbot, J. (1983). Psychological benefits of a wilderness experience. In I. Altman & J. F. Wohlwill (Eds.), *Human behavior and environment: Advances in theory and research* (Vol. 6). New York: Plenum Press.
- Kasper, J. D., Steinbach, U., & Andrews, J. (1994). Caregiver role appraisal and caregiver tasks as factors in ending caregiving. *Journal of Aging and Health, 6*(3), 397-414.
- Kaufman, S. (1993). Values as Sources of the Ageless Self. In J. Kelly (Ed.), *Activity and Aging*. Newbury Park, CA: Sage Publications.
- Kaup, M. L. (2012). *Patterns of culture change households: a graphic ethnography of enviornmental and organizatoinal fit*. (doctoral dissertation), University of Wisconsin-Milwaukee, Milwaukee, WI.
- Kearney, A. R., & Winterbottom, D. (2005). Nearby Nature and Long-Term Care Facility Residents: Benefits and Design Recommendation. In S. Rodiek & B. Schwarz (Eds.), *The Role of the Outdoors in Residential Environments for Aging*. New York: The Haworth Press.
- Kearney, A. R., & Winterbottom, D. (2006). Nearby Nature and Long-Term Care Facility Residents: Benefits and Design Recommendation. *Journal of Housing for the Elderly, 19*(3-4), 7-28.
- Kirlik, A., & Storkerson, P. (2010). Naturalizing Peirce's Semiotics: Ecological Psychology's Solution to the Problem of Creative Abduction. In L. Magnani, W. Carnielli & C. Pizzi (Eds.), *Model-Based Reasoning in Science and Technology* (pp. 31-50): Springer.
- Kiyota, E. (2009). *People-nature interactions: The therapeutic role of nature in elderly residents' everyday experience in a long term care facility*. University of Wisconsin-Milwaukee, Milwaukee, WI (Doctoral dissertation).

- Klauber, M., & Wright, B. (2001). The 1987 Nursing Home Reform Act. The American Association of Retired Persons (AARP). Retrieved Oct 11, 2015, from http://www.aarp.org/home-garden/livable-communities/info-2001/the_1987_nursing_home_reform_act.html
- Koffka, K. (1935). *Gestalt psychology*. NY: Harcourt Brace.
- Kovach, C. (2000). Sensoristasis and imbalance in persons with dementia. *Journal of Nursing Scholarship*, 32(4), 379-384.
- Kovach, C., Weisman, G., Chaudhury, H., & Calkins, M. (1997). Impacts of a therapeutic environment for dementia care. *American Journal of Alzheimer's Disease and Other Dementias*, 12(3), 99-110.
- Kovach, C. R., & Henschel, H. (1996). Behavior and participation during therapeutic activities on special care units. *Activities, Adaptation & Aging*, 20(4), 35-45.
- Kovach, C. R., & Magliocco, J. S. (1998). Late-stage dementia and participation in therapeutic activities. *Applied Nursing Research*, 11(4), 167-173.
- Kovach, C. R., & Meyer-Arnold, E. A. (1996). Coping with conflicting agendas: The bathing experience of cognitively impaired older adults. *Research and Theory for Nursing Practice*, 10(1), 23-36.
- Kovach, C. R., & Schlidt, A. M. (2001). The agitation-activity interface of people with dementia in long-term care. *American Journal of Alzheimer's Disease and Other Dementias*, 16(4), 240-246.
- Krzywinski, M. (2006). The Image Color Summerizer. Retrieved April, 2015, from http://mkweb.bcgsc.ca/color_summarizer/
- Kuhn, T. S. (1970). *The Structure of Scientific Revolutions* (2 ed.). Chicago, IL: The University of Chicago Press.
- Küller, R. (1991). Environmental Assessment, Cognition, and Action. In G. Evans & T. Garling (Eds.), *Environment, Cognition and Action: The Need for Integration* (pp. 111-147). New York: NY: Oxford University Press.
- Kunstler, R. A., & Daly, F. S. (2010). *Therapeutic Recreation Leadership and Programming: Human Kinetics*.
- Lake, S., & May, K. B. (2012). *Digital Media: Concepts and Applications*. Mason, OH: Cengage Learning.

- Lamberth, D. C. (1999). *William James and the metaphysics of experience*. Cambridge: Cambridge University Press Cambridge.
- Lang, J. T. (1987). *Creating architectural theory: The role of the behavioral sciences in environmental design*. New York: Van Nostrand Reinhold
- Lantz, M. S., Buchalter, E. N., & McBee, L. (1997). The wellness group: a novel intervention for coping with disruptive behavior in elderly nursing home residents. *The Gerontologist*, 37(4), 551-557.
- Laumann, K., Gärling, T., & Stormark, K. M. (2001). Rating scale measures of restorative components of environments. *Journal of environmental psychology*, 21(1), 31-44.
- Lawton, M., Fulcomer, M., & Kleban, M. (1984). Architecture for the mentally impaired elderly. *Environment and Behavior*, 16(6), 730.
- Lawton, M. P. (1981). Sensory Deprivation and the Effect of the Environment on Management of the Patient with Senile Dementia. *Clinical aspects of Alzheimer's disease and senile dementia*, 227-251.
- Lawton, M. P. (1982). Competence, environmental press, and the adaption of older people. In M. P. Lawton, P. G. Windley & T. O. Byerts (Eds.), *Aging and the environment*. New York: Springer.
- Lawton, M. P. (1983). Time, Space, and Activity. In G. D. Rowles & R. J. Ohta (Eds.), *Aging and milieu: Environmental perspectives on growing old*. New York: Academic Press.
- Lawton, M. P. (1986). *Environemnt and Aging*. Albany, NY: Center for the Study of Aging.
- Lawton, M. P. (1989). Three functions of the residential environment. *Journal of Housing for the Elderly*, 5(1), 35-50.
- Lawton, M. P. (1999a). *An environmental design lexicon for dementia care*. Philadelphia Geriatric Center. Unpublished proposal. Philadelphia.
- Lawton, M. P. (1999b). Environmental taxonomy: Generalizations from research with older adults. In S. L. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span* (pp. 91-124). Washington DC: American Psychological Association.

- Lawton, M. P., & Nahemow, L. (1973). Ecology and the aging process. In C. Eisdorfer & M. P. Lawton (Eds.), *Psychology of adult development and aging*. Washington, DC: American Psychological Association.
- Lawton, P. (1980). *Environment and aging*. Belmont, CA: Brooks/Cole.
- Lee, S., Dilani, A., Morelli, A., & Byun, H. (2007). Health Supportive Design in Elderly Care Homes. [yes, 12/24/2014
yes, 04222015]. *Architectural Research*, 9(1), 9-18.
- Lee, Y., & Kim, S. (2008). Effects of indoor gardening on sleep, agitation, and cognition in dementia patients—a pilot study. *International Journal of Geriatric Psychiatry*, 23(5), 485-489.
- Les Clarke, M. (2009). Improving nutrition in dementia through menu picture cards and cooking activities.
- Lewin, K. (1946). *Resolving social conflicts and field theory in social science*. Washington, DC: American Psychological Association.
- Li, R., & Klippel, A. (2014). Wayfinding Behaviors in Complex Buildings The Impact of Environmental Legibility and Familiarity. *Environment and Behavior*, 46, 1-29.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75). CA: Sage Publications.
- Lindenmuth, G. F., & Moose, B. (1990). Improving cognitive abilities of elderly Alzheimer's patients with intense exercise therapy. *American Journal of Alzheimer's Disease and Other Dementias*, 5(1), 31-33.
- Lindsley, O. R. (1964). Geriatric behavioral prosthetics. In R. Kastenbaum (Ed.), *New thoughts on old age* (pp. 41-60). IN: Springer.
- Ling, P. (2011). Greenhouse Engineering: Direct Sunlight Affects Temperature Measurement in Greenhouses. *FloriBytes*, VI(2), <http://www.oardc.ohio-state.edu/floriculture/images/FloriBytes0611-GHengineering-temperature.pdf>.
- Liu, C. W. (1994). *From old town to new city: A study of behavior settings and meanings of streets in Taiwan* (Doctoral dissertation), University of Wisconsin--Milwaukee, Milwaukee, WI.

- Lovering, M. J. (1990). Alzheimer's disease and outdoor space: Issues in environmental design. *American Journal of Alzheimer's Disease and Other Dementias*, 5(3), 33-40.
- Lovering, M. J., Cott, C. A., Wells, D. L., Taylor, J. S., & Wells, L. M. (2002). A study of a secure garden in the care of people with Alzheimer's disease. *Canadian Journal on Aging*, 21(3), 417-427.
- Lu, Y., Peponis, J., & Zimring, C. (2009). *Targeted Visibility Analysis in Buildings*. Paper presented at the Correlating Targeted Visibility Analysis with Distribution of People and Their Interactions within an Intensive Care Unit. In the International Space Syntax Symposium, edited by Daniel Koch, Lars Marcus and Jesper Steen.
- Luborsky, M. R., & Rubinstein, R. L. (1995). Sampling in qualitative research rationale, issues, and methods. *Research on Aging*, 17(1), 89-113.
- Lynch, K. (1960). *The image of the city*. Cambridge, MA: MIT Press.
- MacDonald, K. C. (2006). Family and staff perceptions of the impact of the long-term care environment on leisure. *Topics in Geriatric Rehabilitation*, 22(4), 294-308.
- Malpas, J. (2006). *Heidegger's Topology: Being, Place*. Cambridge: The MIT Press.
- Malpas, J. E. (1999). *Place and experience: A philosophical topography*. Cambridge: Cambridge University Press.
- Marcus, C. (2007a). Garden of the Family Life Center, Grand Rapids, Michigan. *Journal of Housing for the Elderly*, 21(3), 285-304.
- Marcus, C., & Barnes, M. (1995). Gardens in Healthcare Facilities: Uses, Therapeutic Benefits & Design Recommendations: Center for Health Design.
- Marcus, C. C. (1999). Acute Care General Hospitals: Typology of Outdoor Spaces. In C. C. Marcus & B. Marni (Eds.), *Healing Gardens: Therapeutic Benefits and Design Recommendation* (pp. 157-234). New York: NY: John Wiley & Sons, inc.
- Marcus, C. C. (2003). Healing havens - Two hospital gardens in Portland, Oregon, win awards for therapeutic values (The Children's Garden at Legacy Emanuel Children's Hospital and The Healing Garden at Good Samaritan Hospital). *Landscape Architecture*, 93(8), 84-+.

- Marcus, C. C. (2007b). Alzheimer's Garden Audit Tool. *Journal of Housing for the Elderly*, 21(1-2), 179-191.
- Marcus, C. C., & Barnes, M. (1999a). Acute Care General Hospitals: Case Studies and Design Guidelines. In C. C. Marcus & B. Marni (Eds.), *Healing gardens: Therapeutic benefits and design recommendations* (pp. 215). Hoboken, NJ: Wiley & Sons.
- Marcus, C. C., & Barnes, M. (1999b). *Healing gardens: Therapeutic benefits and design recommendations*. New York, NY: John Wiley & Sons.
- Marcus, C. C., & Sachs, N. A. (2013). *Therapeutic Landscapes: An Evidence-Based Approach to Designing Healing Gardens and Restorative Outdoor Spaces*. Hoboken, New Jersey: John Wiley & Sons.
- Mark, L., Shaw, R., & Pittenger, J. (2013). Natural Constraints, Scales of Analysis, and Information for the Perception of Growing Faces. In T. R. Alley (Ed.), *Social and applied aspects of perceiving faces*: Psychology Press.
- Marquardt, G. (2011). Wayfinding for people with dementia: a review of the role of architectural design. *HERD*, 4(2), 75.
- Marquardt, G., & Schmieg, P. (2009). Dementia-friendly architecture: environments that facilitate wayfinding in nursing homes. *American Journal of Alzheimer's Disease and Other Dementias*, 24(4), 333-340.
- Marshall, M. N. (1996). Sampling for qualitative research. *Family practice*, 13(6), 522-526.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological review*, 50(4), 370.
- Mason, M. C. (2011). Environmental health. *Nursing Standard*, 26(13), 23-25.
- Mather, J. A., Nemecek, D., & Oliver, K. (1997). The effect of a walled garden on behavior of individuals with Alzheimer's. *American Journal of Alzheimer's Disease*, 12(6), 252-257.
- Matthews, G. (2008). Aristotle: Psychology. In C. Shields (Ed.), *The Blackwell guide to ancient philosophy* (Vol. 23). Malden, MA: Blackwell Publishing.
- Maxwell, J. (1992). Understanding and validity in qualitative research. *Harvard educational review*, 62(3), 279-301.

- May, H. (2010). *Aristotle's ethics: Moral development and human nature*. New York, NY: Bloomsbury Publishing.
- McArthur, M. G. (1988). Exercise as therapy for the Alzheimer's patient and caregiver: Aggressive action in the face of an aggressive disease. *American Journal of Alzheimer's Disease and Other Dementias*, 3(6), 36-39.
- McBride, D. L. (1999). Nursing Home Gardens. In C. C. Marcus & B. Marni (Eds.), *Healing Gardens: Therapeutic Benefits and Design Recommendation* (pp. 385-436). New York: NY: John Wiley & Sons, inc.
- McClannahan, L. E., & Risley, T. R. (1974). Design of Living Environments for Nursing Home Residents Recruiting Attendance at Activities. *The Gerontologist*, 14(3), 236-240.
- Merleau-Ponty, M. (1945). *Phenomenology of Perception* (C. Smith, Trans.). London & New York: Routledge.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Thousand Oak: SAGE Publications.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2013). *Qualitative data analysis: A methods sourcebook* (3 ed.). Thousand Oaks, CA: SAGE Publications.
- Miller, R. L., & Swensson, E. S. (2002). *Hospital and healthcare facility design*. New York: WW Norton & Company.
- Mintzberg, H. (1979). *The structuring of organizations: A synthesis of the research*. NJ: Prentice-Hall.
- Mitchell, J. M., & Kemp, B. J. (2000). Quality of Life in Assisted Living Homes A Multidimensional Analysis. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 55(2), P117-P127.
- Mooney, P., & Nicell, P. (1992). The importance of exterior environment for Alzheimer residents: Effective care and risk management. 5(2), 23-29.
- Moore, K. (2000). *The hidden program of adult day care for the cognitively-impaired: A comparative case study into the negotiation of place*. (Doctoral dissertation), University of Wisconsin-Milwaukee, Milwaukee, WI.

- Moore, K. D., Geboy, L. D., Weisman, G., & Mlezvia, S. (2001). *Designing a Better Day*. Milwaukee: University of Wisconsin-Milwaukee.
- Moos, R. (1974). Systems for the assessment and classification of human. In R. H. Moos & P. M. Insel (Eds.), *Issues in social ecology: human milieus*. Palo Alto: CA: National Press Books.
- Moos, R. (1976). *The human context: Environmental determinants of behavior*. Malabar, FL: Krieger
- Moos, R. (1981). The practical utility of environmental evaluation of sheltered care facilities. In R. Stough & A. Wandersman (Eds.), *Optimizing environments: Research, practice and policy* (pp. 7-21). Washington DC: Environmental Design Research Association.
- Moos, R., & Lemke, S. (1980). Assessing the physical and architectural features of sheltered care settings. *The Journal of Gerontology*, 35(4), 571.
- Moos, R., & Lemke, S. (1994). *Group residences for older adults: Physical features, policies, and social climate*. New York: Oxford University Press
- Morgan, D. G., & Stewart, N. J. (1998). High versus low density special care units: Impact on the behaviour of elderly residents with dementia. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, 17(02), 143-165.
- Morgan, G., & Smircich, L. (1980). The case for qualitative research. *Academy of management review*, 5(4), 491-500.
- Namazi, K. H., & Johnson, B. D. (1992). Pertinent autonomy for residents with dementias: Modification of the physical environment to enhance independence. *American Journal of Alzheimer's Disease and Other Dementias*, 7(1), 16-21.
- Namazi, K. H., Rosner, T. T., & Rechlin, L. (1991). Long-term memory cuing to reduce visuo-spatial disorientation in Alzheimer's disease patients in a special care unit. *American Journal of Alzheimer's Disease and Other Dementias*, 6(6), 10-15.
- Nasar, J. L. (1989). Perception, cognition, and evaluation of urban places *Public places and spaces* (pp. 31-56): Springer.
- Nay, R. (1995). Nursing home residents' perceptions of relocation. *Journal of Clinical Nursing*, 4(5), 319-325.

- Negley, E. N., & Manley, J. T. (1990). Environmental interventions in assaultive behavior. *Journal of Gerontological Nursing*.
- Neisser, U. (1976). *Cognition and Reality: Principles and Implications of Cognitive Psychology*. San Francisco: W.H. Freeman and Company.
- Nelson, D. I., Nelson, R. Y., Concha-Barrientos, M., & Fingerhut, M. (2005). The global burden of occupational noise-induced hearing loss. *American journal of industrial medicine*, 48(6), 446-458.
- Neustadt, L. E. (1985). Adult day care: A model for changing times. *Physical & Occupational Therapy in Geriatrics*, 4(1), 53-66.
- NIDCD. (n.d.). Common Sounds. Retrieved April, 2015, from <http://www.nidcd.nih.gov/staticresources/health/education/teachers/CommonSounds.pdf>
- Nolan, B. A. D., Mathews, R. M., Truesdell-Todd, G., & VanDorp, A. (2002). Evaluation of the effect of orientation cues on wayfinding in persons with dementia. *Alzheimer's Care Today*, 3(1), 46.
- Norris-Baker, C., Weisman, G. D., Lawton, M. P., Sloane, P., & Kaup, M. (1999). Assessing Special Care Units for Dementia: The Professional Environmental Assessment Protocol. In E. Steinfeld & G. S. Danford (Eds.), *Enabling Environments: Measuring the Impact of Environment on Disability and Rehabilitation*. New York: Kuwer Academic/Plenum Publishers.
- O'Connor, Z. (2006). Environmental colour mapping using digital technology: a case study. *Urban Design International*, 11(1), 21-28.
- Oppert, F. (1883). *Hospitals, infirmaries, and dispensaries*. London: John Churchill and Sons
- Ottosson, J., & Grahn, P. (2005). A Comparison of Leisure Time Spent in a Garden with Leisure Time Spent Indoors: On Measures of Restoration in Residents in Geriatric Care. *Landscape Research*, 30(1), 23-55.
- Ousset, P. J., Nourhashemi, F., Albaredo, J. L., & Vellas, P. M. (1998). Therapeutic gardens. *Archives of Gerontology and Geriatrics*, 369-372.
- Owens, J. (1976). Aristotle—Cognition a Way of Being. *Canadian Journal of Philosophy*, 6(1), 1-11.

- Oxley, D., Haggard, L., Werner, C., & Altman, I. (1986). Transactional Qualities of Neighborhood Social Networks. *Environment and Behavior*, 18(5), 640-677.
- Pachana, N., LindsayMcWha, J., & Arathoon, M. (2003). Passive therapeutic gardens: a study on an inpatient geriatric ward. *Journal of Gerontological Nursing*, 29(5), 4.
- Parmelee, P. A., & Lawton, M. P. (1990). The design of sepcial environment for the aged. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (Vol. 3).
- Pasha, S., & Shepley, M. M. (2013). Research note: Physical activity in pediatric healing gardens. *Landscape and Urban Planning*, 118, 53-58.
- Paterniti, D. A. (2003). Claiming identity in a nursing home. *Ways of aging*, 58-74.
- Penwarden, A. D. (1973). Acceptable wind speeds in towns. *Building Science*, 8(3), 259-267.
- Peterson, D. R. (1991). Connection and disconnection of research and practice in the education of professional psychologists. *American Psychologist*, 46(4), 422.
- Pettigrew, S., & Roberts, M. (2008). Addressing loneliness in later life. *Aging & Mental Health*, 12(3), 302-309.
- Plowright, D. (2011). *Using mixed methods: Frameworks for an integrated methodology*. California: SAGE Publications.
- Polkinghorne, D. (1992). Postmodern epistemology of practice. In S. Kvale (Ed.), *Psychology and postmodernism* (Vol. 9). Newbury Park, CA: Sage.
- Pound, P., Gompertz, P., & Ebrahim, S. (1998). A patient-centred study of the consequences of stroke. *Clinical Rehabilitation*, 12(3), 255-264.
- Proshansky, H. (1978). The city and self-identity. *Environment and Behavior*, 10(2), 147-169.
- Rae, H. M. (1990). Older women and identity maintenance in later life. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, 9(03), 248-267.
- Randall, P., Burkhardt, S. S., & Kutcher, J. (1990). Exterior space for patients with Alzheimer's disease and related disorders. *American Journal of Alzheimer's Disease and Other Dementias*, 5(4), 31-37.

- Rappe, E., Kivela, S., & Rita, H. (2006). Visiting outdoor green environments positively impacts self-rated health among older people in long-term care. *HORTTECHNOLOGY-ALEXANDRIA VA-*, 16(1), 55.
- Rappe, E., & Kivela, S. L. (2005). Effects of garden visits on long-term care residents as related to depression. *Horttechnology*, 15(2), 298-303.
- Rappe, E., & Topo, P. (2007). Contact with Outdoor Greenery Can Support Competence Among People with Dementia. *Journal of Housing for the Elderly*, 21(3), 229-248.
- Ratti, C. (2004). Urban texture and space syntax: some inconsistencies. *Environment and Planning B: Planning and Design*, 31(4), 487-499.
- Reed, E. S. (1996). *Encountering the world: Toward an ecological psychology*. New York: NY: Oxford University Press.
- Reeves, W. W. (1996). *Cognition and complexity: The cognitive science of managing complexity*: Scarecrow Press.
- Regnier, V. (2002). *Design for assisted living: Guidelines for housing the physically and mentally frail*. New York: John Wiley and Sons.
- Regnier, V., & Pynoos, J. (1992). Environmental interventions for cognitively impaired older persons. In J.Brren, B. Sloane & G.Cohen (Eds.), *Handbook of Mental Health and Aging*. New York: Academic.
- Relph, E. (1976). *Place and placelessness*. London: Pion
- Research Services Branch-National Institute of Mental Health. (1997). ImageJ: Image Processing and Analysis in Java. Retrieved April, 2015, from <http://imagej.nih.gov/ij/index.html>
- Resnick, H. E., Fries, B. E., & Verbrugge, L. M. (1997). Windows to their world: The effect of sensory impairments on social engagement and activity time in nursing home residents. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 52(3), S135-S144.
- Robinson, D. N. (1989). *Aristotle's psychology*. New York: NY: Columbia University Press.
- Rodaway, P. (2010). Yi-Fu Tuan. In P. Hubbard & R. Kitchin (Eds.), *Key thinkers on space and place*. Thousand Oaks: CA: Sage.

- Rodiek, S. (2002). Influence of an outdoor garden on mood and stress in older persons. *Horticulture*, 13, 13-21.
- Rodiek, S. (2006). Resident perceptions of physical environment features that influence outdoor usage at assisted living facilities. *Journal of Housing for the Elderly*, 19(3), 95-107.
- Roseman, M. G. (2007). Food safety perceptions and behaviors of participants in congregate-meal and home-delivered-meal programs. *Journal of environmental health*, 70(2), 13.
- Rosen, T., Lachs, M. S., Bharucha, A. J., Stevens, S. M., Teresi, J. A., Nebres, F., & Pillemer, K. (2008). Resident-to-Resident Aggression in Long-Term Care Facilities: Insights from Focus Groups of Nursing Home Residents and Staff. *Journal of the American Geriatrics Society*, 56(8), 1398-1408.
- Rowles, G. D. (1983). Geographical dimensions of social support in rural Appalachia. In G. D. Rowles & R. J. Ohta (Eds.), *Aging and milieu: Environmental perspectives on growing old* (pp. 111-130). New York: Academic Press.
- Rowles, G. D. (1984). Aging in rural environments. In I. Atman, M. D. Lawton & J. Wohlwill (Eds.), *Elderly people and the environment: Human behavior and environment* (pp. 129-157). New York: Plenum.
- Rowles, G. D., & Bernard, M. (2013). The meaning and significance of place in old age. In G. D. Rowles & M. Bernard (Eds.), *Environmental Gerontology: Making Meaningful Places in Old Age* (pp. 3-24).
- Rowles, G. D., & Ohta, R. J. (1983). Emergent Themes and New Directions: Reflection on Aging and Milieu Research. In G. D. Rowles & R. J. Ohta (Eds.), *Aging and milieu: Environmental perspectives on growing old*: Academic Press London.
- Ruckdeschel, K., & Van Haitsma, K. (2001). The Impact of Live-in Animals and Plants on Nursing Home Residents: A Pilot Longitudinal Investigation. *Alzheimer's Care Today*, 2(4), 17.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological review*, 110(1), 145.
- Ryff, C. D., & Singer, B. (1998). *The role of purpose in life and personal growth in positive human health*: Lawrence Erlbaum Associates Publishers.
- Sadler, B. (2001). Design to compete in managed healthcare. *Facilities Design & Management*, 20(3), 38-41.

- Sadler, C. K. (2007). *Design Guidelines for Effective Hospice Gardens Using Japanese Garden Principles*. State University of New York.
- Samko, M. A. (2010). Gradient based edge detection in various color spaces. In R. S. Choras (Ed.), *Image Processing & Communications Challenges 2* (pp. 76). Heidelberg: Springer Science & Business Media.
- Sanderson, C. A., & Cantor, N. (1999). A life task perspective on personality coherence. *D. Cervone & Y. Shoda (Hg.), The coherence of personality: Social cognitive bases of consistency*, 372-392.
- Sanz-Andres, A., & Cuerva, A. (2006). Pedestrian wind comfort: Feasibility study of criteria homogenisation. *Journal of Wind Engineering and Industrial Aerodynamics*, 94(11), 799-813.
- Sanz, E., von Cramon Taubadel, N., & Roberts, D. L. (2012). Species differentiation of slipper orchids using color image analysis. *Lankesteriana*.
- Sarifuddin, M., & Missaoui, R. (2005). *A new perceptually uniform color space with associated color similarity measure for content-based image and video retrieval*. Paper presented at the Proc. of ACM SIGIR 2005 Workshop on Multimedia Information Retrieval (MMIR 2005).
- Scarantino, A. (2012). Discrete emotions: from folk psychology to causal mechanisms. In E. Z. Peter & R. D. Ellis (Eds.), *Categorical versus dimensional models of affect: a seminar on the theories of Panksepp and Russell* (Vol. 7): John Benjamins Publishing.
- Schaffranek, R., & Nourian Ghadikolaee, P. (2014). Generative syntax in architecture and urban design.
- Schneekloth, L. H., & Keable, E. B. (1991). *Evaluation of library facilities: a tool for managing change*. Urbana-Champaign: University of Illinois at Urbana-Champaign, Graduate School of Library and Information Science.
- Schoggen, P. (1989). *Behavior settings: A revision and extension of Roger G. Barker's Ecological Psychology*. Stanford, CA: Stanford University Press.
- Schomer, P. D., Suzuki, Y., & Saito, F. (2001). Evaluation of loudness-level weightings for assessing the annoyance of environmental noise. *The Journal of the Acoustical Society of America*, 110(5), 2390-2397.
- Seamon, D. (1979). *A geography of the lifeworld: Movement, rest, and encounter*. London: Croom Helm

Seigfried, C. H. (1990). *William James's radical reconstruction of philosophy*. Albany: State University of New York Press.

Seligman, M. E. P. (1975). *Helplessness: On depression, development, and death*: WH Freeman/Times Books/Henry Holt & Co.

Sherif, C. W., & Sherif, M. (1967). Attitude as the individuals' own categories: The social judgment-involvement approach to attitude and attitude change. In C. W. Sherif & M. Sherif (Eds.), *Attitude, Ego-involvement, and Change*. : J. Wiley.

Sherman, S. A., Varni, J. W., Ulrich, R. S., & Malcarne, V. L. (2005). Post-occupancy evaluation of healing gardens in a pediatric cancer center. *Landscape and Urban Planning*, 73(2-3), 167-183.

Shibata, T., & Kato, T. (1998). *Modeling of subjective interpretation for street landscape image*. Paper presented at the Database and Expert Systems Applications.

Shih, C. J. (2013). A Study of Nursing Home Gardens: Using a Case-Study Approach to Understanding How Gardens Are Constructed in Nursing Homes. In J. Wells & E. Pavlides (Eds.), *Proceedings of the 44th Annual Conference of the Environmental Design Research Association* (pp. 152-162). Providence, Rhode Island: The Environmental Design Research Association (EDRA).

Shumaker, S. A. (1987). People in Places: A Transactional View of Settings. In C. S. Yadav (Ed.), *Perceptual and Cognitive Image of the City* (Vol. 12). New Delhi: Concept Publishing Company.

Silverstein, M., & Jacobson, M. (1985). Restructuring the hidden program: Toward an architecture of social change. In W. Preiser (Ed.), *Programming the built environment*. New York: Van Nostrand.

Slavicek, L. C. (2009). *New York City's Central Park*. New York, NY: Infobase Publishing.

Sloane, P., Mitchell, C., Weisman, G., Zimmerman, S., Foley, K., Lynn, M., . . . Grant, L. (2002). The Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH): An observational instrument for assessing the physical environment of institutional settings for persons with dementia. *Journals of Gerontology series B: Psychological Sciences and Social Sciences*, 57(2), 69.

Sloane, P., Weisman, G., Calkins, M., Teresi, J., & Ramirez, M. (1993). The Therapeutic Environment Screening Scale, 2+. Unpublished assessment protocol.

- Söderback, I., Söderström, M., & Schäländer, E. (2004). Horticultural therapy: The 'healing garden' and gardening in rehabilitation measures at Danderyd Hospital Rehabilitation Clinic, Sweden. *Pediatric Rehabilitation*, 7(4), 245-260. doi: 10.1080/13638490410001711416
- Soja, E. W. (1989). *Postmodern geographies: The reassertion of space in critical social theory*. London: Verso.
- Speziale, H. S., Streubert, H. J., & Carpenter, D. R. (2011). *Qualitative research in nursing: Advancing the humanistic imperative*. Philadelphia: Lippincott Williams & Wilkins.
- Staats, H., Kieviet, A., & Hartig, T. (2003). Where to recover from attentional fatigue: An expectancy-value analysis of environmental preference. *Journal of environmental psychology*, 23(2), 147-157.
- Stanford Encyclopedia of Philosophy. (2008). Aristotle. Retrieved December, 2014, from <http://plato.stanford.edu/entries/aristotle/>
- Starešinič, M., Simončič, B., & Bračko, S. (2011). Using a digital camera to identify colors in urban environments. *Journal of Imaging Science and Technology*, 55(6), 60201-60201-60201-60204.
- Stea, D., & Downs, R. M. (1970). From the outside looking in at the inside looking out. *Environment and Behavior*, 2(1), 3-12.
- Steinzor, B. (1950). The spatial factor in face to face discussion groups. *The Journal of Abnormal and Social Psychology*, 45(3), 552.
- Stephen, K. (1986). Perception of an Uncertain Environment. In S. Kaplan & R. Kaplan (Eds.), *Humanscape: Environments for People*. North Scituate, MA: Ulrich's Books.
- Suckiel, E. K. (1982). *The Pragmatic Philosophy of William James*. Indiana: University of Notre Dame Press.
- Sugihara, S., & Evans, G. W. (2000). Place attachment and social support at continuing care retirement communities. [5]. *Environment and Behavior*, 32(3), 400-409.
- Susman, G. (1983). Action research: a sociotechnical systems perspective. In C. Morgan (Ed.), *Beyond method: Strategies for social research* (pp. 95-113). California: Sage Publications.

- Susman, G. I., & Evered, R. D. (1978). An assessment of the scientific merits of action research. *Administrative Science Quarterly*, 582-603.
- Sutor, B., Rummans, T. A., & Smith, G. E. (2001). *Assessment and management of behavioral disturbances in nursing home patients with dementia*. Paper presented at the Mayo Clinic Proceedings.
- Tanner, B., Tilse, C., & De Jonge, D. (2008). Restoring and sustaining home: The impact of home modifications on the meaning of home for older people. *Journal of Housing for the Elderly*, 22(3), 195-215.
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of Mixed Methods in Social & Behavioral Research*. Thousand Oaks, CA: SAGE Publications.
- The National Institute for Occupational Safety and Health (NIOSH). (1998). Criteria for a Recommended Standard: Occupational Noise Exposure (Revised Criteria 1998). Retrieved April, 2015, from <http://www.cdc.gov/niosh/docs/98-126/pdfs/98-126.pdf>
- Thomas, W. (1996). *Life worth living: How someone you love can still enjoy life in a nursing home: The Eden alternative in action*. St. Louis, MO: Vanderwyk & Burnham.
- Trott, A. M. (2013). *Aristotle on the Nature of Community*. New York, NY: Cambridge University Press.
- Trotto, N. (2001). They all fall down. *Contemporary longterm care*, 24(4), 38.
- Tuan, Y.-F. (1974). *Topophilia: A Study of Environmental Perception, Attitudes And Values*. New Jersey: NJ: Prentice-Hall Inc.
- Tuan, Y.-F. (1977). *Space and place: The perspective of experience*: U of Minnesota Press.
- U.S. Department of Health and Human Services. (2015). Nursing Home Compare. Retrieved January, 15, 2013, from <https://www.medicare.gov/nursinghomecompare/search.html>
- Ulrich, R. (1981). Natural versus urban scenes: Some psychophysiological effects. *Environment and Behavior*, 13(5), 523.

- Ulrich, R. (1983). Aesthetic and affective response to natural environment. In I. Altman & J. F. Wohlwill (Eds.), *Human behavior and environment: advances in theory and research* (Vol. 6). New York: Plenum.
- Ulrich, R. (1984). View through a window may influence recovery from surgery. *Science*, 224(4647), 420.
- Ulrich, R. (1999). Effects of Gardens on Health Outcomes: Theory and Research. In C. C. Marcus & M. Barnes (Eds.), *Healing Gardens: Therapeutic Benefits and Design Recommendation*. New York: John Wiley & Sons Inc.
- Ulrich, R., Simons, R., Losito, B., Fiorito, E., Miles, M., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments¹. *Journal of environmental psychology*, 11(3), 201-230.
- Ulrich, R. S. (1986). Human responses to vegetation and landscapes. *Landscape and Urban Planning*, 13, 29-44.
- Ulrich, R. S. (1992). How design impacts wellness. *Healthcare Forum Journal*, 20, 20-25.
- Valentin, D., & Chanquoy, L. (2012). Olfactory categorization: a developmental study. *Journal of experimental child psychology*, 113(3), 337-352.
- Van Haitsma, K., Curyto, K., Saperstein, A., & Calkins, M. (2004). The Environmental Design Lexicon: Project description and outcomes. . *Unpublished manuscript*.
- Vasku, M. (2013). *Generative Improvement of Street Networks Based on Space Syntax: Applied in a case study on an informal settlement in Jeddah*. Paper presented at the eCAADe 2013: Computation and Performance—Proceedings of the 31st International Conference on Education and research in Computer Aided Architectural Design in Europe, Delft, The Netherlands, September 18-20, 2013.
- Vernooij-Dassen, M. (2007). Meaningful activities for people with dementia.
- Wahl, H. (2001). Environmental influences on aging and behavior. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the psychology of aging* (5th ed., pp. 215–237). San Diego, CA: Academic Press.
- Wahl, H., & Weisman, G. (2003). Environmental gerontology at the beginning of the new millennium: Reflections on its historical, empirical, and theoretical development. *The Gerontologist*, 43(5), 616.

- Weisman, G. (1981). Evaluating Architectural Legibility Way-Finding in the Built Environment. *Environment and Behavior*, 13(2), 189-204.
- Weisman, G. (1997a). Environments for older persons with cognitive impairments. In G. T. Moore & R. W. Marans (Eds.), *Advances in Environment, behavior and design* (Vol. 4, pp. 315-346). New York: Plenum Press.
- Weisman, G., Lawton, M. P., Calkins, M., & Sloane, P. (1993). *PEAP: Professional environmental assessment protocol. Unpublished manuscript.*
- Weisman, G. D. *Pragmatism, Practice & Patterns* (Unpublished manuscript), Department of Architectural and Urban Planning, University of Wisconsin-Milwaukee, Milwaukee, WI.
- Weisman, G. D. (1982). Developing man-environment models. In MP Lawton, P Windley & T. Byerts (Eds.), *Aging and the environment: Theoretical approaches* (pp. 69-79).
- Weisman, G. D. (1983a). Environmental programming and action research. *Environment and Behavior*, 15(3), 381-408.
- Weisman, G. D. (1983b). Environmental programming and action research. *Environment and Behavior*, 15(3), 381.
- Weisman, G. D. (1987). Improving Way-finding and Architectural Legibility in Housing for the Elderly. In V. Regnier & J. Pynoos (Eds.), *Housing the aged: Design directives and policy considerations*: Elsevier Publishing Company.
- Weisman, G. D. (1997b). Environments for Older Persons with Cognitive Impairments: Toward an Integration of Research and Practice. In G. T. Moore & R. W. Marans (Eds.), *Advances in Environment, Behavior and Design* (Vol. 4, pp. 315-343). New York: Plenum Press.
- Weisman, G. D. (2001). The Place of People in Architectural Design. In A. Pressman (Ed.), *Architectural design portable handbook: A guide to excellent practices* (pp. 159-170).
- Weisman, G. D., Chaudhury, H., & Moore, K. D. (2000). Theory and Practice of Place: Toward and Integrative Model. In R. L. Rubinstein, M. Moss & M. Kleban (Eds.), *The many dimensions of aging*. New York: NY: Springer Publishing Company.
- Weisman, G. D., & Moore, K. D. (2003). Vision and Values. *Journal of Housing for the Elderly*, 17(1), 23-37.

- Werner, C., Altman, I., Oxley, D., & Haggard, L. M. (1987). People, place and time: A transactional analysis of neighborhoods. In I. Altman & C. M. Werner (Eds.), *Advances in personal relationships* (pp. 243-275). Greenwich, CT: JAI.
- Whitehouse, S., Varni, J. W., Seid, M., Cooper-Marcus, C., Ensberg, M. J., Jacobs, J. R., & Mehlenbeck, R. S. (2001). Evaluating a children's hospital garden environment: Utilization and consumer satisfaction. *Journal of environmental psychology, 21*(3), 301-314.
- Whitlatch, C. J., Feinberg, L. F., & Tucke, S. S. (2005). Measuring the Values and Preferences for Everyday Care of Persons With Cognitive Impairment and Their Family Caregivers. *The Gerontologist, 45*(3), 370-380.
- Wicker, A. W. (1984). *An introduction to ecological psychology*. Monterey, CA: Brooks/Cole.
- Williams, A. M., Dawson, S., & Kristjanson, L. J. (2008). Exploring the relationship between personal control and the hospital environment. *Journal of Clinical Nursing, 17*(12), 1601-1609.
- Williams, J. (2002). Spaces for remembering : Some thoughts on the design of facilities for the elderly mentally ill. *HD Journal of Healthcare Design & Development, 33*(6), 12-14, 18.
- Williams, J. (2006). Answers: Why official temperatures are recorded in the shade, *USA TODAY*. Retrieved from http://usatoday30.usatoday.com/weather/resources/askjack/2006-08-21-shade-temperature_x.htm
- Windley, P. G., & Weisman, G. (1977). Social Science and Environmental Design: The Translation Process. *JAE, 31*(1), 16-19. doi: 10.2307/1424530
- Wisconsin Department of Health Services. (2013). Consumer Information Report for Nursing Homes: Summary 2013 Retrieved June, 24, 2015, from <https://www.dhs.wisconsin.gov/library/cir-appx-c-nhs-2013.htm>
- Wohlwill, J. (1966). The physical environment: A problem for a psychology of stimulation. *Journal of Social Issues, XXII*(4), 29-38.
- Wohlwill, J. (1974). Human adaption to level of environmental stimulation. *Human Ecology, 2*, 127-147.
- Wohlwill, J. (1976). Environmental Aesthetics: The Environment as a Source of Affect. In I. Altman & J. Wohlwill (Eds.), *Human Behavior and Environment: Advances in Theory and Research*. New York: Plenum Press.

- Wohlwill, J. F. (1968). Amount of stimulus exploration and preference as differential functions of stimulus complexity. *Perception & Psychophysics*, 4(5), 307-312.
- Wohlwill, J. F. (1973). The environment is not in the head. *Environmental design research*, 2, 166-181.
- Wohlwill, J. F. (1983). The concept of nature: a psychologist's view. In I. Altman & J. F. Wohlwill (Eds.), *Human behavior and environment: advances in theory and research* (Vol. 6). New York: Plenum.
- Wohlwill, J. F. (1988). Artistic imagination during the latency period revealed through computer graphics. *Constructivism in the computer age*, 15-35.
- Wohlwill, J. F., & Kohn, I. (1973). Environment as experienced by migrant-adaptation-level view. *Representative Research in Social Psychology*, 4(1), 135-164.
- Wolf, B. (2005). Brunswik's original lens mode. University at Albany. Retrieved December, 2014, from <http://www.albany.edu/cpr/brunswik/notes/WolfOriginalLens2005.pdf>
- Wood, D., & Beck, R. (1990). Do's and Don'ts: Family Rules, Rooms, and Their Relationships. *Children's Environments Quarterly*, 2-14.
- Wright, O. R., Connelly, L. B., Capra, S., & Hendrikz, J. (2013). Determinants of foodservice satisfaction for patients in geriatrics/rehabilitation and residents in residential aged care. *Health Expectations*, 16(3), 251-265.
- Wunderlich, G. S., Sloan, F. A., & Davis, C. K. (1996). *Nursing Staff in Hospitals and Nursing Homes: Is It Adequate?* Washington, D.C.: National Academies Press.
- Yao, L., & Algase, D. (2006). Environmental ambiance as a new window on wandering. *Western Journal of Nursing Research*, 28(1), 89-104.
- Yin, R. K. (1994). *Case study research*. CA: Sage publications Newbury Park.
- Yin, R. K. (2003). Analyzing case study evidence *Case study research: design and methods* (3 ed.). Thousand Oaks, CA: Sage.
- Yin, R. K. (2013). *Case Study Research: Design and Methods: Design and Methods*. Thousand Oaks, CA: SAGE Publications.

- Zajonc, R. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35(2), 151-175.
- Zeisel, J. (1984). *Inquiry by design: Tools for environment-behavior research*. NY: Cambridge University Press.
- Zeisel, J. (2005). Environment, neuroscience, and alzheimer's disease. *Alzheimer's Care Today*, 6(4), 273-279.
- Zeisel, J. (2007). Healing gardens for people living with Alzheimer's challenges to creating n evidence base for treatment outcomes. In C. W. Thompson & P. Travlou (Eds.), *Open space: people space*. London and New York: Taylor & Francis.
- Zeisel, J., Hyde, J., & Levkoff, S. (1994). Best practices: An Environment Behavior (EB) model for Alzheimer special care units. *American Journal of Alzheimer's Disease and Other Dementias*, 9(2), 4.
- Zeisel, J., Silverstein, N. M., Hyde, J., Levkoff, S., Lawton, M. P., & Holmes, W. (2003). Environmental Correlates to Behavioral Health Outcomes in Alzheimer's Special Care Units. *The Gerontologist*, 43(5), 697-711.
- Zeisel, J., & Tyson, M. M. (1999). Alzheimer's Treatment Garden. In C. C. Marcus & M. Barnes (Eds.), *Healing Gardens: Therapeutic Benefits and Design Recommendation*. New York: John Wiley & Sons Inc.
- Zimmerman, S., Sloane, P. D., Williams, C. S., Reed, P. S., Preisser, J. S., Eckert, J. K., . . . Dobbs, D. (2005). Dementia care and quality of life in assisted living and nursing homes. *The Gerontologist*, 45(suppl 1), 133-146.
- Zisberg, A., Young, H. M., Schepp, K., & Zysberg, L. (2007). A concept analysis of routine: relevance to nursing. *Journal of Advanced Nursing*, 57(4), 442-453.

APPENDICES

Appendix A: Experiential Themes Derived From Descriptions of Physical Settings in Literature

SPATIAL PROPERTIES

Spatial properties	Descriptive or evidence-based finding	Reference	Experiential themes
Location	"Ideally, the garden should be located at the end of a corridor" because it is "readily discovered and acts as a loop which returns residents to the building and facilitates walking."	Mooney & Nicell, 1992, p. 29	High awareness
	"Places where plantings and bird feeders can be established outside windows at the end of the corridors. " "A secure outdoor patio was located directly off of the unit" Outdoor space is not used by residents mainly because of low awareness of where it is located.	Cutler & Kane, 2005, p. 45	Easy orientation and noticeable location
	Residents have a higher awareness of outdoor space that can be physically and visually accessed from a major indoor activity area.	Marquardt & Schmieg, 2009	Knowable place
	"Some of the gardens at the study sites were difficult to access, requiring extensive navigation through the facility to reach an exit and further navigation once outside to reach the garden." "A second strategy to increase resident use is to design several smaller garden spaces located throughout the facility instead of a central courtyard. This could reduce the distance from the residents' rooms and help to delineate wayfinding, thereby reducing disorientation."	Kearney & Winterbottom, 2005, p. 22, 23	Accessible outdoor space Easy navigation and wayfinding
	" Residents cannot use outdoor space if it is not available to them or the distance to traverse is too long for them to use outdoor space independently and staff is not available to assist them." "The new solarium room was located at the very end of the first floor... but residents do not use it because of its distant proximity to resident rooms. The administrator admitted that the location is very problematic."	Cutler & Kane, 2005, p. 45	Assistance of functioning ability
	Location may be related to activity participation rate.	Voelkl et al., 1995	Competence in activities
	A long distance from resting places to outdoor space is perceived as a barrier of outdoor walk.	Rantakokko et al, 2010;	Less environmental press

Visual connection with indoor spaces and within outdoor spaces	"There is a large window to allow the residents to view the full extent of the garden to both remind them of the possibility of entering the garden and to promote positive reminiscences."	Detweiler et al., 2005, p. 29 Detweiler et al., 2012	Home-like settings Predictable & recognizable space
	"Legibility of circulation and visual access to entries and exits is important in larger spaces, especially for users who may suffer dementia, memory loss, or anxiety." "As much as possible, windows in the residents' rooms and in common areas should be oriented towards views of nature."	Kearney & Winterbottom, 2005, p. 23-24	Visual aesthetics Wayfinding and orientation
	"The highly statistically significant improvements in residents' mean agitation scores.. may indicate that it may not be necessary for residents to actually wander through the garden in order to reduce their agitation. It may be enough to be able to just sit and be able to take in the view, the smells and the sunlight."	Edwards & Gustafsson, 2008, p. 507	Quality sensory stimulation
	"The door was solid, with no view of the outdoor space. When it was closed, no one wanted to go out, as clients could not actually see the garden."	Lovering et al., 2002, p. 424	Predictable and recognizable space
	"A woman took advantage of a 2-foot space between her windows and shrubbery that had been planted to provide that unit with visual privacy to create a narrow garden and aviary." "No high cement walls are called for, but rather subtle screening and enclosure through plantings. Walls would only work if they were low—at table height."	Cranz & Young, 2006, p.84, 87	Privacy in bedrooms
	Visual access that include " a legible garden entry, and characterization of views to the outside to include appealing areas, such as colorful flowers" influences use of outdoor space	Grant & Wineman, 2007, p. 111	Visual aesthetics Recognizable space
	Plant screens may help prevent visual intrusion on resident's privacy in rooms.	Sherman et al. (2005)	Privacy in bedrooms
	"At least visual access to a green environment should be made available to the residents in institutional living, since seeing the plants may enhance the mood of the elderly and can help in the regulation of emotions."	Rappe & Topo, 2007, p. 245	Quality sensory stimulation

<p>"The outdoor space needs to be highly visible to the residents...a high degree of visibility to the outdoor space maximizes staff comfort levels about residents being outside. Visibility of garden spaces from inside for both staff and residents is critical to its use."</p>	Brawley, 2002, p. 9	Monitored outdoor space
<p>It is important for staff to keep residents in view and the use of larger windows provides greater visibility to the outside and helps alleviate staff stress."</p> <p>"Visibility of garden spaces from inside by both staff and residents is critical to its use. Highly visible outdoor spaces help to maximize staff comfort levels about residents being outside."</p> <p>"Visible connection to destinations is important. Some residents can become easily disoriented and need recognizable clues to lead them back to a more familiar area."</p>	Brawley, 2007, p. 273, 276	Monitored outdoor space Wayfinding and orientation
<p>Residents feel secure because they can see staff close by and hear sounds coming from indoors.</p> <p>Residents feel uncomfortable when being observed by others; they need place that prevent visual intrusion.</p> <p>The outdoor environment with visual access to neighborhoods was perceived as beneficial for the residents. Residents are thus not isolated from reality.</p>	Bengtsson & Carlsson, 2006	Sense of safety Privacy in outdoor space Information updating and reality orientation
<p>Higher and smaller windows cut off the view to outside from wheelchairs and various locations in the room.</p> <p>"Large "windows to the world" with windowsills lined with African violets provided views of the ever-changing Minnesota weather along with vista views of the fields and river beyond."</p> <p>"The space was small and close to resident room windows so residents felt as if they were invading the privacy of others"</p> <p>" For those residents who fear leaving the security of the building, views from windows provided an alternative. "</p>	Cutler & Kane, 2005, p. 42	Observing nature Privacy in bedrooms
<p>"Residents and staff can have a clear view of the entire courtyard providing spatial orientation "</p> <p>"This design creates contact with nature even from an inside position with a generous use of windows and glass doors."</p>	Lee et al., 2007, p. 13	Visual aesthetics Wayfinding and orientation

	Views to outdoor areas "will increase resident orientation to time, space and season and will ensure a less institutional image for the facility...Outdoor views from public areas will reduce the sense of confinement and provide valuable stimuli and information to clients...These views will be especially effective if they are located at key decision-making points and if they lead to accessible outdoor areas."	Cohen & Weisman, 1991, p. 76	Visual stimulation Home-like features Spatial and reality orientation
--	---	------------------------------	---

Layout	"A wander garden may have structured spaces that reduce disorientation"	Detweiler et al., 2005, p. 30	Wayfinding and orientation
	"The layout of the garden must be easily understood to minimize confusion for cognitively impaired"	Brawley, 2002, p. 9	Legibility
	"The layout of the garden must be easily understood. To minimize confusion for cognitively impaired individuals the layout must be simplified."	Brawley, 2007, p. 276	Legibility and simplicity
	"A specialized layout...is divided into two quite distinct, clearly defined parts, by the use of screens of trees and bushes so that there is a zone for "strollers" and another one for the most robust elderly residents, staff and neighbors."	Ousset et al., 1998, p. 370	Recognizable and distinct sections
	"The oval-shaped courtyard is divided into separate 'rooms' by green hedges creating privacy for each unit."	Lee et al., 2007, p. 17	Recognizable and distinct sections
	"Simple layout and distinctive landmarks (e.g., trees, sculptures, gazebos, arbors, fragrant gardens) visible at short distances may also assist individuals in finding their way independently."	Lovering et al., 1990, p. 38	Wayfinding and orientation
	"The layout of the space should be easily understood."	York, 2009, p. 202	Legibility
	It is important to provide layout that is "readable" by users.	Marcus & Barnes, 1999;	Legibility
	The layout of garden space must be easily understood to minimize confusion for cognitively impaired.	Sachs, 1999	Legibility

Path system	"There are walking paths that promote movement, encourage contact with plants, and lead the residents to protected areas for sitting and socializing" "The paths may be circular and continuous with no dead ends to encourage cardiovascular exercise." "For climates with extended periods of inclement weather, dementia wander gardens may have enclosed perimeter walkways...with exists and entrances into both the wander garden and the dementia unit."	Detweiler et al., 2005, p. 31	Sensory stimulation & micro-climatic comfort Socialization Wayfinding Meaningful walk
	"The walkway system was a figure-eight pattern that linked destination points or activity zones throughout the garden."	Lovering et al., 2002, p. 420	Wayfinding Meaningful destination

"Walkways can serve as orientation aids to link interesting destination points (e.g., areas for exercise, music therapy, concerts and casual use), or to provide diversions that may be required to defuse problematic behavior such as agitation."	Lovering et al., 1990, p. 38	Regulation of sensory stimulation Social interactions Wayfinding and orientation Meaningful activity
"A flat cement pathway around the perimeter of the western side of the courtyard functions as a kind of track for those who want to walk."	Cranz & Young, 2006, p.78	Exercise and meaningful walking
The path system "allowed residents to move through the garden and return to the building without any confusion, and thus promoted walking."	Mooney & Nicell, 1992, p. 29	Wayfinding and orientation
"Circular or loop corridors and walkways minimize frustration" because residents "tend to walk corridors and "get stuck" at the end of them, not realizing that they can turn around and walk the other way."	Mooney & Nicell, 1992, p. 29	Wayfinding and orientation
"The pathway networking linking the sensory garden to the overall site context is crucial in encouraging the number of users who will engage with the features placed along it."	Hussein (2010, p. 122)	Sensory stimulation
"Legibility of circulation and visual access to entries and exits is important in larger spaces, especially for users who may suffer dementia, memory loss, or anxiety."	Kearney & Winterbottom, 2005, p. 23	Recognizable routes
"Walking paths are opportunities for innovation. Places for socialization and activity, for example, can be woven into the path as destinations making the walk significantly more interesting. Seating areas along the walking path give walkers and watchers an opportunity for greeting and conversing with others."	Brawley, 2007, p. 276	Social interactions Meaningful activity
"The therapeutic garden constitutes an outdoor zone in which one has avenues and walks or strolls along planned routes, affording sunlit areas and shaded zones depending on the season and the position of the sun...Straight lines ...bring the users back to their point of departure under ever watchful eye of staff."	Ousset et al., 1998, p. 369-370	Micro-climatic comfort Wayfinding and orientation
"A "challenge walk" paved with loose materials would respond to traditional adult characteristics of wanting to be challenged and to explore and would push the limits of wayfinding and orientation."	Hoover, 1995, p. 7	Wayfinding and orientation Meaningful and challenging activity
"A wide continuous route should begin and end in the same place and have an absence of hidden spaces to minimize the fear of getting lost."	Lovering et al., 1990, p. 38	Continuous and predictable routes
"Designing paths that weave through the outdoor space and not just loop around it make the environment more appealing to potential users."	York, 2009, p. 204	Visual stimulation
Three types of paths provide different walking experience: looped walking paths, shortcuts and paths for just passing through.	Zeisel & Tyson, 1999;	Wayfinding

	A secured indoor or outdoor circular path can reduce concerns about escape or intrusiveness.	Sutor et al., 2001	Safety and security
	"Delightful paths for wandering can be created — negotiable and comprehensible paths that circle gardens and pass by places for sitting."	Cohen & Weisman, 1991, p. 75	Accessible and manageable paths Wayfinding and orientation
	"Another was the need for the loop path, a circuit walk. This would accommodate the wanderers and the walkers on a sinuous path of leisurely progression, offering a variety of views along the way. As a means of consistent reassurance, it delivers the user back to the origin of the journey."	Beckwith & Gilster, 1997, p. 12	Visual stimulation Wayfinding

Entry points	"For climates with extended periods of inclement weather, dementia wander gardens may have enclosed perimeter walkways...with exists and entrances into both the wander garden and the dementia unit." The garden and walkway doors can be opened by the patients either from the inside or the outside." " All decisions lead back to the beginning. This might be considered an intermediate wayfinding solution and an appropriate response to the notion of safety and security."	Detweiler et al., 2005, p. 32	Micro-climatic comfort Accessible entry Wayfinding and orientation
	"The exterior door should allow views and access into the garden."	Mooney & Nicell, 1992, p. 29	Accessible entry Predictable navigation
	"Instead of one access point that may be far from patients' rooms, multiple access opportunities should be created so that patients won't feel the physical effort is too great, lose their stamina, or get disorientated in the process of seeking a physical interaction with nature."	Kearney & Winterbottom, 2005, p. 23	Accessible entry Simple and direct entry space
	"Residents in the care home are able to enter the courtyard easily from the common rooms or the multi-purpose room."	Lee et al. (2007, p. 13)	Competence in entering outdoor space High awareness of entry points
	"The access to the outdoor area or balcony should be located in a central area within the living area."	Marquardt & Schmieg, 2009, p. 338	High awareness of entry points

Spatial variety	<p>Public-private transition: "The transition between public and private needs to be more gradual."</p> <p>Individual and group space: "More niches and better-placed seating would likely increase use of the inner courtyard." "Sub-territories are needed in almost all common open-spaces, this courtyard in particular, so that people feel comfortable going to "their spot"."</p>	Cranz & Young, 2006, p.82, 86, 87	Choice of different degree of private and public space Personalized space
	<p>Indoor-outdoor transition: "...covered seating areas near the entry...would not only encourage more independent use but also allow more programmed activities to take place on the terrace within easy access from the interior of the unit during harsher weather conditions." "All of the facilities would, therefore, benefit by adding such a zone that offered not only physical protection from inclement weather but would provide a necessary area for visual adjustment, particularly for the elderly individuals with sensitivity to glare."</p> <p>Individual space: "...the private areas a distance from the patio/terrace were the "pull-off"...and shady chairs..." It could encourage outdoor usage by adding seating near the entry and by adding seating to areas away from buildings.</p>	Grant & Wineman, 2007, p. 113	Micro-climatic comfort safe environments Easy access Private sitting
	<p>Indoor-outdoor transition: "The highly statistically significant improvements in residents' mean agitation scores...may indicate that it may not be necessary for residents to actually wander through the garden in order to reduce their agitation." A transitional area may be enough "to be able to just sit and be able to take in the view, the smells and the sunlight."</p>	Edwards & Gustafsson, 2008, p. 507	Regulation of sensory stimulation
	<p>Individual and group space: "In larger spaces, the garden can be divided into areas of varying size and level of privacy. Some spaces can be designed for socialization and a higher activity level. Other parts of the garden can be designed for residents, family, and visitors who want a place to sit that is comfortably private."</p> <p>Indoor-outdoor transition: "Porches can be used as active transition spaces—places to have lunch, supper, or even snacks—as a way of easing residents outside."</p>	Brawley, 2002, p. 9-10	Private sitting Social interactions

<p>Sunny and shade space: "Seating areas under the trees can filter sunlight and give the illusion of privacy."</p> <p>Indoor-outdoor transition: "Porches are transition spaces that provide an invitation and a way of beginning to ease residents to the outdoors. Rocking chairs often entice reluctant residents outdoors to rock and watch the activities in the garden. A cup of coffee or tea, snacks or food on the porch can be incentives or first steps to the walking path and other activities. Transition spaces are vitally important in linking older adults to the outdoor environment."</p>	Brawley, 2007, p. 277, 278	<p>Micro-climatic comfort Easy access Privacy Home-like settings</p>
<p>Indoor-outdoor transition: It is important to have "seating places in the entrances where people came and went and a lot was happening."</p>	Bengtsson & Carlsson, 2006, p. 8	<p>Regulation of sensory stimulation Opportunities for socialization</p>
<p>Indoor-outdoor transition: It is important to provide "an outside area at the entrance to the facility where residents could sit and watch the activity of people coming and going or wait for transportation. When the space was available, it was a popular place with the residents, often preferred to an inner courtyard area."</p>	Cutler & Kane, 2005, p. 41	<p>Regulation of sensory stimulation Opportunities for socialization</p>
<p>Sunny and shade space: Sunny seating areas allows residents to expose their face, arms, forearms and legs to the sun to encourage the metabolism of vitamin D.</p>	Ousset et al., 1998	<p>Micro-climatic comfort Healthy and meaningful activity</p>
<p>Individual and group space: " A strolling path with larger and smaller spaces would allow a resident the choice to be alone or not be alone and would be considered a traditional adult characteristic consistent with autonomy and a sense of self determination.</p>	Hoover, 1995, p. 7	<p>Independence Choice of different degree of private and public space</p>
<p>Individual and group space: There is "variety of spaces that support individual, group, and family uses, and that are easy to access without major effort"</p> <p>Indoor-outdoor transition: There are "safety of elements and transition zones that eliminate physical hazards and disconnections between indoors and outdoors."</p>	York, 2009, p. 202, 205	<p>safe environments Independence Choice of different degree of private and public space</p>
<p>Indoor-outdoor transition: "An outside sitting area close to the exit from the living area provides better locating of the outdoor space than none"</p>	Marquardt & Schmieg, 2009, p. 338	<p>Wayfinding and orientation</p>
<p>Indoor-outdoor transition: "Trees or trellis can define a space; it shelters one from the intense sun; and it filters light to create a more gentle effect. This can be particularly satisfying when used at the entry of a building to create a transition between a relatively dark space to bring sunlight. This</p>	Beckwith & Gilster, 1997, p. 10	<p>Micro-climatic comfort safe environments</p>

	aspect is particularly important to older individuals whose eyes may be sensitive to glare."		
	Individual and group space: "Outdoor alcoves will give residents secluded places in which to visit with family members or from which to observe outdoor activities."	Cohen & Weisman, 1991, p. 75	Interesting views Privacy
Width of walkways	A wide and accessible pathway is most popular among users.	Moore & Cosco, 2007	Wheelchair accessible paths
	"A wide continuous route should begin and end in the same place and have an absence of hidden spaces to minimize the fear of getting lost."	Lovering et al., 1990, p. 38	Wheelchair accessible paths Wayfinding and orientation
	"The width of the walkways should be a minimum of 36 inches, which would permit one-way traffic for wheelchair or walker users. Paths at five feet allow side-by-side walking, passing of two persons"	York, 2009, p. 204	Wheelchair accessible paths
Size or scale of activity sections	"The main aisle led to a large square, the shaded terrace, which provided an opportunity for large-group gatherings in the shade of an existing Norway maple tree."	Lovering et al., 2002, p. 419	Micro-climatic comfort Social activity
	"The space was too small and close to resident room windows so residents felt as if they were invading the privacy of others"	Cutler & Kane, 2005, p. 43	Privacy in bedrooms
	"A generous size pavilion to accommodate tables, chairs and storage for supplies is a wonderful sheltered space for activities such as arts and crafts, painting classes, gardening, flower arranging, and even outdoor concerts".	Brawley, 2007, p. 277	Micro-climatic comfort Social activity Meaningful activity
	To accommodate the use of walkers and wheelchairs, sufficient activity space should be provided.	Beckwith & Gilster, 1997;	Wheelchair accessible areas
	A large open paved area should be provided to support a variety of group activities or for use of gerry chairs.	Zeisel & Tyson, 1999	Wheelchair accessible areas Participation of social events
	High density of outdoor space will be viewed as crowded and aversive, and social contacts are enforced and privacy is minimized.	Ulrich, 1999	Appropriate sensory stimulation Privacy Appropriate amount of social interactions
	"There are many possible activities that should be accommodated, including both spontaneous encounters and spontaneous observation of nature and staff, neighborhood, and other residents' activities and planned activities (e.g., musical events, puppet shows). There should be space to accommodate wheelchair users for these activities."	Cohen & Weisman, 1991, p. 79	Interesting views Group and wheelchair accessibility Social interactions Meaningful activity

	"The size of the landscaped grounds affords both the flexibility and the opportunity to create a number of behavioral settings without conflict (e.g., places of solitude and repose as well as places of high activity)." "The size of the open space is rather daunting, in that the proportions are grand, and thus evoke the sense of one's own fragile qualities."	Sachs, 1999, p. 303	Sense of security Autonomous and spontaneous activity Social interactions
	"Depending on the size, location, and design, may create a fishbowl experience for those using it."	Marcus, 1999, p. 128	Privacy
	"The garden can be entered, but due to its size and to mobility limitations within the garden, it functions predominantly as a viewing garden."	Barnes & Marcus, 1999, p. 10	Visual aesthetics Autonomous and spontaneous gardening

Size or scale of green space	"A combination of soft and hard landscape and landscape furniture places adjacent to a continuous primary pathway that offered easy access to the functional features recorded the highest preferences."	Hussein, 2010, p. 122	Visual aesthetics Accessible built features
	"The patio area was just the perfect size for a small garden, walkways, patches of grass, a bright umbrella table and a glider where three friends sat together on a daily basis."	Cutler & Kane, 2005, p. 42	Visual aesthetics Social interactions
	"Lawns and grassy areas that are level, firm and regularly mowed can provide additional pathways for residents to enjoy the out-of-doors. Temporary, portable surfacing can be applied to grassy areas for special events to mitigate tripping hazards that may exist."	York, 2009, p. 204	Safe outdoor walking
	A large open green space can be used for activities.	Sachs, 1999	Appropriate sensory stimulation Social interactions

Size or scale of gardening sections	"Provide a small spot (preferably waist-high) where residents can "get their hands dirty." Residents discuss working in the soil and often talk about wishing they could plant something like they used to do. Such a provision enhances physical therapy."	Hernandez, 2007, p. 143	Regulation of sensory stimulation Meaningful activity
--	---	-------------------------	--

SENSORY PROPERTIES

Sensory properties	Descriptive or evidence-based finding	Reference	Experiential themes
VISUAL: Plant materials and wild life	"Gardens include a variety of plants to promote visual, olfactory, and tactile stimulation and to attract birds and butterflies." "Trees may provide shade, color, seasonal variation, and sound when the leaves rustle in the wind." "Various tall grasses such as wheat can be planted to expand visual and tactile experiences."	Detweiler et al., 2005, p. 32 Detweiler et al., 2012	Sensory stimulation
	"Having free access to a quiet garden may reduce agitation by allowing the residents with dementia to avoid the excessive stimulation, noise, and crowding of the interior of the dementia unit."	Detweiler et al., 2009, p. 323	Regulation of sensory stimulation
	"A viewing platform overlooks the Australian bush, a finch aviary, a woodpile, a quiet area with a water feature and raised growing beds where residents can dig and pick produce" "The highly statistically significant improvements in residents' mean agitation scores.. may indicate that it may not be necessary for residents to actually wander through the garden in order to reduce their agitation. It may be enough to be able to just sit and be able to take in the view, the smells and the sunlight."	Edwards & Gustafsson, 2008, p. 500; 507	Regulation of sensory stimulation home-like settings
	"It was important to see trees, flowers and shrubs outdoors...to observe and to smell nature, to get exercise and fresh air, to see other people and to calm down."	Rappe & Kivela, 2005, p. 300	Regulation of sensory stimulation
	The path "led individuals from the covered terrace along the main aisle, featuring a promenade of flowering trees under planted with perennials designed to bloom throughout the season."	Lovering et al., 2002, p. 420	Visual aesthetics
	"Residents take special delight in a "secret garden" between the windows and hedges"	Cranz & Young, 2006, p. 83	Visual aesthetics
	"Greenery, flowers, wildlife, and water elements were all attractants to outdoor usage"	Rodiek, 2006, p. 104	Sensory stimulation
	It is important to get "daylight into the rooms and the view from the window with color, flowers and greenery." "The color of autumn, the variation when the trees turned red and orange and the arrival of horse chestnuts was also much enjoyed by the residents."	Bengtsson & Carlsson, 2006, p. 7	Visual interests
	"Plant more flowers with bright colors. Residents notice bright yellow and red flowers and enjoy a variety of color. When they notice the flowers it cues them to go outdoors or cues conversation." "Providing fall and spring plant material so that there is "seasonal interest" increases time awareness and cues conversation."	Hernandez, 2007, p. 143-144	Visual interests Social interaction Season awareness
	"Abundant plantings, flowers, trees, birdbaths, and	Cutler & Kane,	Interesting

fountains created an idyllic setting where butterflies flourished and families and residents visited." "The outdoor space became a place to socialize and to watch the rabbits in the "rabbit den.""	2005, p. 42	scenes
"Gardens should contain a diversity of plants and that, where possible, advantage should be taken of "borrowed" views of trees and other vegetation." "Plants might be selected for visual variety, aroma, or ability to attract wildlife."	Kearney & Winterbottom, 2005, p. 23	Interesting scenes
"Alternate landmarks (trees, bushes, flowers, decorative elements, benches) obviate the risk of loss of bearings and a resulting feeling of helplessness. These landmarks are completed with familiar signposting, identical to that used inside the establishment so that there is continuity indoor and out."	Ousset et al., 1998, p. 370	Familiar environments Wayfinding and orientation
"Plantings which address the color, smell and memories" provide visual and olfactory stimulation and bring people back in time and evoke memories of the past.	Hoover, 1995, p. 7	Sensory stimulation Home-like environments
"A stimulating view with activity is probably most desirable, especially one in which residents can view daily life, as they might do sitting on the porch at home. Indeed, lack of appropriate view or activity ("nothing to see") was one of the problems cited with some of the outdoor areas."	Cohen-Mansfield, 2007, p. 49	Interesting views Home-like environments
There is "visual appeal that includes a prevalence of natural green material, reduction in concrete and other hard surfaces, views of nature and appealing textures."	York, 2009, p. 202	Greenery overlook
"Trees can be clues to climatic conditions. Tossed by the wind, the foliage flutters, sways or snaps, animating the space and providing an indication of the wind force. This can be a source of interest to the viewer. " "Elements that provoke memory can be included in many creative ways. Personal memories are stimulated by old fashioned plants: pansy, peony, snapdragon and nasturtium. Lavender, thyme and mint merge visual and olfactory pleasures."	Beckwith & Gilster, 1997, p. 10	Observation of nature Reminiscent
"The more opportunities there are to sit and rest the more likely it is that older adults will get out and walk. It pays to provide plenty of comfortable seating along walking paths, allowing places to rest, places to enjoy watching birds at the feeder."	Brawley, 2007, p. 277	Observation of nature

VISUAL: Color or luminous contrast, shape or form of furniture or architectural façade and paving	"With the outdoor lights on, there was the stimulus for the residents to try to find the garden doors...leaving the garden lights on with the doors closed may have increased sun downing..."	Detweiler et al., 2005, p. 43	Safety and security
	"The bright sunlight and the glare from the white concrete walkways throughout the outdoor garden are barriers for residents who had cataracts and other sight impairments."		
	"The contrast between the green grass and the gray-stone-dust walkway surface was intended to provide a visual cue to lead people along the path to the various destination points."	Lovering et al., 2002, p. 420	Wayfinding and orientation
	"The lighting had been added to allow use of the garden in the evenings..."	Lovering et al., 2002, p. 420	Safety and security
	"Falls can be minimized by ensuring that walking surfaces are slip-resistant, glare-free, and of uniform texture and color. Tinting concrete will eliminate hazardous glare. " "Walkways should have clearly distinguishable borders and good contrast between the pavement and its immediate surrounds."	Brawley, 2002, p. 10	Safe walking experience
	"Surface materials should provide uniform texture in a medium color value and good contrast between the walking surfaces itself and the immediate surroundings" " Sufficiently tinting concrete and other surface materials enhances safety by eliminate hazardous glare."	Brawley, 2007, p. 272	Safe walking experience
	"Staff usually brought Christmas trees and Christmas lights to the outdoor environment for the residents to see the light glimmer through the windows."	Bengtsson & Carlsson, 2006, p. 7	Interesting views Home-like environments Meaningful activity
	"Provide a walking path with less glare. Adding color to the concrete would be better. It gets too bright for the residents." "Additional shade trees could assist with the glare issue. More shade trees would be inviting to use the outdoor space."	Hernandez, 2007, p. 143	Safe walking experience
	"High contrast paving patterns can confuse some users who read the dark pavers as voids and may resist using the pathway."	Kearney & Winterbottom, 2005, p. 23	Safe walking experience
	"The walks set in sunny areas but avoiding the full glare of the sun."	Ousset et al., 1998, p. 370	Safe environments (prevention of fall)

	<p>"It is essential to maintain an adequate level of light while minimizing glare. Glare from bright white paving creates particular problems...Glare can be reduced by the use of site furniture such as tables, chairs and garbage receptacles constructed of non-reflective materials."</p> <p>"Selecting the degree of contrast is as important as the selection of colors. Light furniture on a dark ground provides the necessary contrast to be viewed easily by individuals and large light letters are easier to read when placed on a dark background. Color contrast between doorway and wall can provide a helpful cue to orient individuals to entrances...Color contrasts should not be used on the ground itself...this can result in a loss of balance as the individual attempts to step down on dark pavers."</p>	Lovering et al., 1990, p. 36	Safe environments (prevention of fall)
	"For people with low vision or who are blind, the use of materials with different textures or contrasting colors placed across pathways is used to indicate the presence of entrances, exits, seating or other key points of information along the route."	York, 2009, p. 206	Safe walking experience
	"The problem of glare, particularly for older individuals, should be considered in the selection of paving material. A fine textured, slip resistant surface is essential. At the same time, the aesthetics of paving is a major factor in the space. Color, texture and the refinement of details all contribute to the affective response of the space."	Beckwith & Gilster, 1997, p. 11	Visual aesthetics Safe walking experience

	"A water feature would provide both visual and auditory interest."	Kearney & Winterbottom, 2005, p. 23	Sensory stimulation
AUDITORY: Water sounds	"The wind rustling in the trees, the water running out of a pond, the smell of the damp soil, the heat of the sun warming the skin, face, hands and arms, all this is an encouragement to natural relaxation and brings a	Ousset et al., 1998, p. 372	Regulation of sensory stimulation
	"For individuals with Alzheimer's disease, the aesthetic appeal of an attractive fountain can be extremely effective in gardening. Hearing the gentle murmur of a stream of water is also soothing."	Beckwith & Gilster, 1997, p. 8	Auditory interests
	"Trees may provide shade, color, seasonal variation, and sound when the leaves rustle in the wind."	Brawley et al., 2008, p. 32	Sensory stimulation
AUDITORY: Nature sounds	"A natural environment, consisting of recorded songs of birds, babbling brooks, or small animals, together with large, bright pictures matching the audiotapes" reduce agitation in nursing home residents.	Cohen-Mansfield, 2004, p. 301	Auditory interests
	A trend toward less trespassing, exist-seeking and other agitated behavior in an enhanced environments with "wall murals and wall posters of forests, valleys, and other vistas in colors...Artificial plants and trees ...tape-recorded nature sounds such as the song of birds..."	Cohen-Mansfield & Werner, 1998, p. 202	Regulation of sensory stimulation

AUDITORY: Noise	"Having free access to a quiet garden may reduce agitation by allowing the residents with dementia to avoid the excessive stimulation, noise, and crowding of the interior of the dementia unit."	Detweiler et al., 2009, p. 323	Regulation of sensory stimulation
	"Noise management would benefit from softening the acoustic surfaces of the building walls that enclose the courtyard."	Cranz & Young, 2006, p. 87	Reduced noise
	"Individuals with Alzheimer's disease may become overwhelmed, confused and disoriented when attempting to discriminate between a variety of noises...Background sounds can be dampened by the use of baffling materials, such as plants, that reduce the reflection of sound."	Lovering et al., 1990, p. 36	Control of background noise Clear and oriented environments

OLFACTORY & TASTING: Plant materials: annuals, herbs & garden-grown food	"The highly statistically significant improvements in residents' mean agitation scores...may indicate that it may not be necessary for residents to actually wander through the garden in order to reduce their agitation. It may be enough to be able to just sit and be able to take in the view, the smells and the sunlight."	Edwards & Gustafsson, 2008, p. 507	Regulation of sensory stimulation
	"It was important to see trees, flowers and shrubs outdoors...to observe and to smell nature, to get exercise and fresh air, to see other people and to calm down..."	Rappe & Kivela, 2005, p. 300	Regulation of sensory stimulation
	Edible plants are chosen for gardening activities because of "familiarity; edibility; simple cultivation and easy thriving; fast growth rate; repetitive pattern of culture; cost effectiveness; and limited space of the institution"	Lee & Kim, 2008, p. 486	Home tasting Familiar food
	"The opportunity for residents to actually pick flowers was found to be important. When they picked lavender, for example, the resident usually held it and continued to smell it for the rest of the day."	Cox et al., 2004, p. 42	Sensory stimulation
	"Smelling, feeling and discussing the flowers was a source of great joy for the residents." "Fruit and berries were appreciated, just to taste or to bake a cake with them." "Outdoors allow you to feel the wind against your skin, the scent of flowers or new-mown grass and you can take off your shoes and feel the grass against your feet and you get fresh air and daylight"	Bengtsson & Carlsson, 2006, p. 7	Sensory stimulation Familiar food Meaningful activity
	"A resident made good use of a push lawnmower cutting the grass on a daily basis and the ripe cucumbers and tomatoes became salads using recipes that somehow the residents had not forgotten."	Cutler & Kane, 2005, p. 42	Home tasting Familiar food Meaningful activity
	"Plants might be selected for visual variety, aroma, or ability to attract wildlife."	Kearney & Winterbottom, 2005, p. 23	Sensory stimulation

	"Porches are transition spaces that provide an invitation and a way of beginning to ease residents to the outdoors. Rocking chairs often entice reluctant residents outdoors to rock and watch the activities in the garden. A cup of coffee or tea, snacks or food on the porch can be incentives or first steps to the walking path and other activities. Transition spaces are vitally important in linking older adults to the outdoor environment."	Brawley, 2007, p. 278	Sensory stimulation Familiar settings
--	--	-----------------------	--

TACTILE: Environmental temperature	Non-use of garden space is lined with too hot or too sunny weather.	Cohen-Mansfield et al., 1999 Cohen-Mansfield, 2007 Dahlkvist et al., 2014; Hernandez, 2007	Micro-climatic comfort Safe body comfort
	"The most frequently used areas of the garden...were the terrace and grass under the maple tree."	Lovering et al., 2002, p. 420	Micro-climatic comfort Safe body comfort
	"A sheltered pavilion provides a space where activities currently programmed for inside can be taken outside."	Brawley, 2002, p. 10	Micro-climatic comfort Safe body comfort
	"All aspects of micro-climatic comfort should be considered, which means protection from sun and wind and reduction of glare."	Mooney & Nicell, 1992, p. 29	Micro-climatic comfort Safe body comfort
	"The wind rustling in the trees...the heat of the sun warming the skin, face, hands and arms, all this is an encouragement to natural relaxation and brings a feeling of physical and mental well-being."	Ousset et al., 1998, p. 372	Micro-climatic comfort
TACTILE: Wind (air pressure)	Outdoors allow you to feel the wind against your skin, the scent of flowers or new-mown grass and you can take off your shoes and feel the grass against your feet and you get fresh air and daylight.	Bengtsson & Carlsson, 2006, p. 7	Sensory stimulation
	A screened area offering shelter from the winds would be a welcome addition.	Marcus & Barnes, 1999;	Micro-climatic comfort
	Non-use of garden space is lined with too windy weather.	Hernandez, 2007	Micro-climatic comfort
TACTILE: Nature materials: plants, soil, water	Edible plants are chosen for gardening activities because of "familiarity; edibility; simple cultivation and easy thriving; fast growth rate; repetitive pattern of culture; cost effectiveness; and limited space of the institution"	Lee & Kim, 2008, p. 486	Sensory stimulation Familiar food Meaningful activity
	There is "a quiet area with a water feature and raised growing beds where residents can dig and pick produce"	Edwards & Gustafsson, 2008, p. 507	Sensory stimulation

	<p>"Rather than sitting indoors, they could wander around, pick flowers, and hose the garden together."</p> <p>"It was an automatic thing; as soon as she saw the hose, she went for it. Then she started to pull dead flower heads off." The visitor went on to describe her friend's background "She came from a farm where water was really precious."</p>	Cox et al., 2004, p. 42	Sensory stimulation Familiar settings Meaningful activity
	<p>"Outdoor space allows you to feel the wind against your skin, the scent of flowers or new-mown grass and you can take off your shoes and feel the grass against your feet and you get fresh air and daylight."</p> <p>Residents "they picked flowers for the maypole and there were music and dance performances in the garden."</p>	Bengtsson & Carlsson, 2006, p. 7	Sensory stimulation
	<p>"A resident made good use of a push lawnmower cutting the grass on a daily basis and the ripe cucumbers and tomatoes became salads using recipes that somehow the residents had not forgotten."</p>	Cutler & Kane, 2005, p. 42	Sensory stimulation Familiar food Meaningful activity
	<p>Various tall grasses such as wheat can be planted to expand visual and tactile experiences.</p> <p>"Some wander gardens include sandboxes where the residents can use their hands or simple safe tools for digging and other activities with supervision."</p>	Detweiler et al., 2005, p. 32	Sensory stimulation Meaningful activity

BUILT FEATURES

Built features	Descriptive or evidence-based finding	Reference	Experiential themes
Pavement Edges Finishing	"Level, slip-resistant, glare-free walking surfaces help to minimize falls due to the high incidence of osteoporosis in the elderly."	Brawley, 2007, p. 272	Safe environments (prevention from fall)
	"Walking surfaces remain "nonslip" in wet and dry conditions and are free of irregularities such as cracks, potholes, or uneven spots."	Brawley, 2002, p. 10	Safe environments (prevention from fall)
	<p>"Unitary surfaces, such as asphalt and concrete, are considered accessible surfaces and paving brick is also compliant with accessibility standards if appropriately applied and maintained."</p> <p>"The edges of the pathway should be flush with the surrounding grade to accommodate use of a wheelchair, scooter or crutches on the path."</p> <p>"Level walkways reduce the risk of falls and should provide enough slope for drainage."</p>	York, 2009, p. 203	Safe environments (prevention from fall) Accessible walkways
	"Smooth walking surfaces are critical as many users use wheelchairs, rely on walkers, tend to shuffle or are unsteady when walking."	Kearney & Winterbottom, 2005, p. 23	Safe environments (prevention)

			from fall)
	"Steep and uneven paths" are a problem to discourage outdoor visits.	Rappe & Kivela, 2005, p. 300	Safe environments (prevention from fall) Accessible walkways

Wheelchair touch pad/automatic door	"The doors to the garden from the walkways were too heavy to open for many staff members managing wheelchair patients, for many of the ambulating but debilitated patients, for some elderly visiting caretakers, for patients with merry walkers, and for solo residents in wheelchairs.	Detweiler et al., 2005, p. 43	Accessible entry
	"Heavy doors and thresholds prevent outdoor visits of people who are not independently mobile."	Rappe et al., 2006, p. 58	Independent outdoor use
	"Access to the outdoor area quite cumbersome and wonder..."	Cohen-Masfield & Werner, 1998, p.434	Easy access
	"The heavy door out to the garden limited garden use... because of the need for air conditioning, it was often kept closed on hot days."	Lovering et al., 2002, p. 424	Easy access
	It is important to "keep doors unlocked, have manageable doors and avoid changes in elevation."	Grant & Wineman, 2007, p. 112	Accessibility
	Poor utilization seems to be linked with poor accessibility to the gardens such as the lack of automatic door.	Heath and Gifford (2001, p. 41)	Accessibility
	Railings, low thresholds and edges and lifts help resident access to outdoor space.	Bengtsson & Carlsson, 2006	Support of functioning ability
	"Automatic doors facilitated access to this enchanted space directly from both units. " "No hard surface path leading to the porch which greatly reduced accessibility for residents in wheel chairs."	Cutler & Kane, 2005, p. 41, 43	Accessibility
	"Accessibility to nature is well developed through wheelchair ramps, handrails, and other supportive devices eliminating potential obstacles. "	Lee et al., 2007, p. 17	Accessibility and functioning
	"Automatic doors, adequate space in which the individual can maneuver and store aids which are not in use, frequent rest stops, appropriate seating with backs and arm rests which allow for independent access, minimal changes in grade and avoidance of cross slopes on patios and walkways " increase accessibility for people with physical limitation.	Lovering et al., 1990, p. 38	Independence and accessibility
	"Doors should not require excessive force to open and door handles should not require grasping and twisting for those who may have limited hand use." "A step less transition from indoors to the outdoors accommodates those with decreased strength, endurance, balance, and mobility.	York, 2009, p. 203	Easy access and increased competence

	"Thresholds should be flush with the floor or no more than 1/4 inch high"		
--	---	--	--

Handrail Ramp	"The handrails that are supposed to help residents get around the gardens were viewed as dangerous (residents might become wedged in the rail gaps or fall over it)."	Heath & Gifford, 2001, p. 41	Safe walking experience
	It is important to provide "a few outdoor handrails for residents in the garden space so that those who have an unsteady gait have something to hold onto while walking. Residents have a habit of using the handrails or walkers indoors, and a continuation of that design element and physical support would allow them to be more confident going outdoors."	Hernandez, 2007, p. 143	Safe walking experience
	"Rails can reassure those that might have limited physical capacity, and frequent opportunities for seating will assist those with limited endurance."	Kearney & Winterbottom, 2005, p. 23	Enhanced competence
	Accessibility can be increased through adding handrails or help of volunteers in transporting residents to the open space.	Cohen-Mansfield, 2007	Safe transporting Enhanced competence
	"Where steps exist a ramp can be installed at a maximum running slope of 1:12"	York, 2009, p. 203	Accessibility

Emergency alarm Communication device Monitor	The lack of device to monitor outdoor space makes staff reluctant to allow residents to use the garden so "the garden is often closed due to the increased fear of having a fallen resident be left in the garden for prolonged intervals before being found when there was no sufficient nursing staff to visually monitor residents in the garden."	Detweiler et al., 2005, p. 43	Safety and security
	There should be safety measures in place like monitors or communication device. "One such example is use of an enclosed area to which residents have free access and monitoring of residents by visual contact or TV monitors. This type of arrangement also enhances the residents' autonomy and sense of control."	Cohen-Mansfield, 2007, p. 49	Safety and security
	"Outdoor intercom call boxes can be placed strategically throughout the outdoor living space. Wireless call boxes provide two-way communication and can be useful for individuals with cognitive impairments who may lose their way within an outdoor space."	York, 2009, p. 206	Safety and security

	"Some wander gardens include sandboxes where the residents can use their hands or simple safe tools for digging and other activities with supervision."	Detweiler et al., 2005, p. 32	Sensory stimulation
--	---	-------------------------------	---------------------

Raised bed Planters Sandbox	"An opening in the perennial bed south of the main aisle allowed access to the vegetable garden...the garden plots were not raised."	Lovering et al., 2002, p. 420	Sensory stimulation Accessible gardening
	"The lack of a raised bed in the vegetable garden made it difficult for those who could not bend down to participate in individual and group gardening activities."	Lovering et al., 2002, p. 424	Sensory stimulation Accessible gardening
	"The allotment gardens were used to grow vegetables, flowers, and herbs. These small plots were used more than the other features of the courtyard."	Cranz & Young, 2006, p. 80	Sensory stimulation
	"Raised planters allow residents to sit or stand while gardening rather than having to get down on hands and knees."	Brawley, 2007, p. 277	Sensory stimulation Safe environments (prevention from fall) Accessible gardening
	"Easily accessible flower-beds planted out with aromatic plants, flowers, bushes, fruit trees...can provide activity and natural physical exercise (gardening)...a familiar landscape, integrated into the garden area just as they are in the traditional houses of the surrounding countryside complete with their vegetable gardens, orchards and ornamental flowerbeds."	Ousset et al., 1998, p. 371	Sensory stimulation Accessible gardening Familiar settings Meaningful activity
	"Gardens with handicapped accessible raised planters and ground-level planters for horticultural therapy as well as general gardening" are considered as stimulation without stress. "There are several bird feeding stations (small birds only) and two raised planters specially designed for wheelchair accessibility."	Hoover, 1995, p. 7-8	Sensory stimulation Easy access to plants and animals
	"The therapeutic planting boxes, garden furniture, and fountains function as a landmark to the residents, especially to the elderly with dementia."	Lee et al., 2007, p. 13	Wayfinding and orientation
	Elevated gardens can encourage participation in activities and evoke positive behavior.	Cohen-Mansfield, 2007	Regulation of sensory stimulation Accessible gardening
	"Elevated garden beds at various heights that provide knee clearance make it easier to reach and water plants from a seated position, as can containers of varying heights."	York, 2009, p. 205	Enhanced competence
	"Raised planters facilitate the individual's desire to reach the soil, to plant a tomato or to smell the flowers."	Beckwith & Gilster, 1997, p. 12	Sensory stimulation Easy access to plants

Pergola Gazebo Arbor Solarium Conservatory	Weather is a significant barrier to wander garden use; the garden usually closes from October to March and no solarium allows people to enjoy garden view or sun.	Detweiler et al., 2005; Detweiler et al., 2012	Visual interests & micro-climatic comfort Autonomous outdoor use
	Weather is unpredictable and uncooperative. "The planned activity (which was the means to get people to spend time outdoors) had to be modified to be more individualized-based than group."	Calkins et al., 2007, p. 226	Sensory stimulation Protected environments Flexibility & accessibility Social interactions
	An adjoining atrium/sunroom "overlooks the rest of the garden and can be partly opened to the air, smells and sunlight from the garden" "The migration of residents to the sunlit atrium with no coercion has pleasantly surprised the staff and residents' families. The atrium is part of the garden and can be partly opened so that residents can feel the breeze and experience the sunlight and the aromas emanating from the garden." "The increase in interaction between residents in this area (atrium) may be partly because there is no television in the atrium and so may not be directly attributable to the atrium itself but staff considers lack of a TV a positive design component in the new environment."	Edwards & Gustafsson, 2008, p. 507	Sensory stimulation Protected environments Spontaneous outdoor use
	"Cold and windy weather and slippery walks were considered to be particular hindrance...The only way to obviate the effects of adverse weather is to provide sheltered outdoor environments and maintain walking paths in good condition." "It is normal to restrict outdoor visits among old people during winter because of the danger of falling on slippery walks."	Rappe et al., 2006, p. 58	Sensory stimulation Protected environments Accessible paths
	Weather condition is an issue. "Slippery walks and snow in the winter, as well as cold and windy weather year round, were regarded as common hindrances."	Rappe & Kivela, 2005, p. 300	Sensory stimulation Protected environments Accessible paths
	"If the weather was too hot, too cold or rainy, residents could not be taken for their outdoor visits. Some residents were more influenced by the weather than others."	Cohen-Masfield & Werner, 1998, p.433	Sensory stimulation Protected environments
	"Different areas of the garden were utilized at different times of the year, due to the different microclimatic features of the garden."	Lovering et al., 2002, p. 420	Micro-climatic comfort
	"If the sun is too hot, or the weather too cold or rainy, some of the residents use the corridors inside the buildings as a kind of circuit for walking."	Cranz & Young, 2006, p. 78	Safe walking experience & protected environments Accessible walkways

	"All aspects of micro-climatic comfort should be considered, which means protection from sun and wind and reduction of glare."	Mooney & Nicell, 1992, p. 29	Micro-climatic comfort Safe environments
	Residents are sensitive to the weather and they deliberated about whether to go out or not because of climatic factors.	Bengtsson & Carlsson, 2006	Micro-climatic comfort
	"A solarium or conservatory can act as an extension of the outdoors since the residents often complain of being cold, or the weather being 'too windy' even in the summertime. This could be located off of a common living or dining area. Such a feature could assist with heating in the winter and provide a place for horticultural therapy."	Hernandez, 2007, p. 143	Sensory stimulation Protected environments Meaningful gardening
	A solarium/patio area is located on the first floor with resident rooms with very attractive decoration. It is "at the very end of the first floor. It is a lovely room with floor to ceiling windows and several skylights. Doors from the space lead directly to an outside area complete with lovely plantings and patio furniture."	Cuter & Kane, 2005, p. 42;	Sensory stimulation Protected environments High awareness
	"Some protection from inclement weather should also be integrated into the garden design as lack of protection was frequently cited as a barrier to getting outside more. Shelter from rain, shade from bright sun, and heat lamps in cooler weather may encourage greater use of garden spaces."	Kearney & Winterbottom, 2005, p. 24	Sensory stimulation Protected environments
	"A pergola provides security, direction, enclosure, and a sense of safety, and at the same time, provides for exploration through the design of open space and a sense of risk."	Hoover, 1995, p. 7	Sensory stimulation Protected environments Enhanced competence Visual cues
	Gazebos are considered a better protection from the weather.	Cohen-Mansfield, 2007	Protected environments
	Although difficult to control, glare can be reduced by providing shaded areas through the use of shade trees, or structures such as pergolas, awnings and umbrellas. "Simple layout and distinctive landmarks (e.g., trees, sculptures, gazebos, arbors, fragrant gardens) visible at short distances may also assist individuals in finding their way independently."	Lovering et al., 1990, p. 36	Sensory stimulation Safe environments Wayfinding and orientation
Shaded terrace Porch	"While Ms. N. did not want to miss any of the visits outside, and preferred to sit under a covered patio rather than remain on her unit." "Participant #1 repeatedly refused to go outside or to stay outside complaining that it was too hot or too humid, even in days in which the temperature was quite comfortable to the research assistant."	Cohen-Masfield & Werner, 1998, p.433	Micro-climatic comfort
	"The main aisle led to a large square, the shaded terrace, which provided an opportunity for large-group gatherings in the shade of an existing Norway maple tree."	Lovering et al., 2002, p. 420	Micro-climatic comfort Opportunity of

socialization		
"The influence of weather means there is a need for shade. Some kinds of shades could also protect from rain. But such structures should be limited and small, and sensitively placed so as not to block the light or views from units on the first-floor."	Cranz & Young, 2006, p. 86	Visual aesthetics Protected & monitored environments
"A primary design recommendation for all the sites would be to include near the garden entry covered, protected areas with a variety of seating. " "...covered seating areas near the entry...Would not only encourage more independent use but also allow more programmed activities to take place on the terrace within easy access from the interior of the unit during harsher weather conditions."	Grant & Wineman, 2007, p. 113	Micro-climatic comfort Protected environments Autonomous outdoor use Social interaction
"Participants reported the need for more satisfactory overhead shelter, better walking paths, and comfortable places to sit outside."	Rodiek, 2006, p. 102	Micro-climatic comfort Protected environments Accessible paths
"A sheltered pavilion provides a space where activities currently programmed for inside can be taken outside. " "Porches can be used as active transition spaces—places to have lunch, supper, or even snacks—as a way of easing residents outside. "	Brawley, 2002, p. 10	Sensory stimulation Protected environments Social interaction
"A house with a screened-in porch for sitting and watching (or a gazebo) would be considered a traditional adult pastime."	Hoover, 1995, p. 7	Sensory stimulation Protected environments Familiar settings
"Covered areas with accessible seating with sink and potting stations can provide shade and cover from the weather."	York, 2009, p. 205	Sensory stimulation Protected environments Support of functioning ability
"A sun-protected sitting area with enough tables and chairs for all the residents should be placed in the balcony or on the terrace. In this way, caregivers can still supervise the residents while working inside. This also responds to the need of some residents to stay close to the group of caregivers or fellow residents."	Marquardt & Schmieg, 2009, p. 338-339	Protected and monitored environments Social interaction
"Effective design features, such as strategically placed planting to act as wind breaks, trees to provide shade, and the building mass itself for enclosure, can extend the time and season of use of outdoor spaces."	Cohen & Weisman, 1991, p. 78	Micro-climatic comfort Autonomous and spontaneous

	outdoor use
--	-------------

Umbrella table Glider	Movable shade umbrellas, deciduous trees, and vine-topped pergolas would be able to provide shade and not to block the light or views from units.	Cranz & Young, 2006, p. 86	Micro-climatic comfort Monitored outdoor space Awareness of outdoor activity
	Provision of shade "(awning or umbrellas could assist) is important since the sun and glare are barriers to use."	Hernandez, 2007, p. 143	Micro-climatic comfort Safe environments (prevention from fall)
	"The patio area was just the perfect size for a small garden, walkways, patches of grass, a bright umbrella table and a glider where three friends sat together on a daily basis."	Cutler & Kane, 2005, p. 42	Social interaction
	"Seating areas under the trees can filter sunlight and give the illusion of privacy while tables with adjustable umbrellas provide shaded areas for protection from the sun and shelter from showers."	Brawley, 2007, p. 278	Micro-climatic comfort Safe environments (prevention from sunburn)
	Umbrella tables can protect from the sun.	Cohen-Mansfield, 2007	Micro-climatic comfort Safe environments (prevention from sunburn)

Movable mesh aluminum tables and chairs Moveable wicker Rock chairs Plastic chairs	"Clients were observed moving chairs just to get to their destination."	Lovering et al., 2002, p. 424	Autonomy
	"Furniture should be heavy and stable with seat heights of about 18 inches."	Mooney & Nicell, 1992, p. 29	Safe furniture
	"Poorly balanced or poorly constructed furniture is unsafe and oversized seating is uncomfortable for sitting too and difficult to get up and out of the chair safely. Many finishes are too rough for fragile skin."	Brawley, 2007, p. 277	Sensory experience Safe furniture
	Lawn furniture needs to meet the needs of residents in terms of height of seats, its safety, location and aesthetic quality	Cohen-Mansfield, 2007	Sensory experience Safe furniture
	"Flexible furnishings also allow individuals to arrange themselves to hear their companions more easily."	Lovering et al., 1990, p. 37	Autonomy Social interactions

	Chairs and tables should be "provided along walking paths, within garden areas, at places to observe nature (i.e., watching birds, rabbits, squirrels, deer) and in common areas in order to socialize and visit with family and friends."	York, 2009, p. 205	Sensory experience Social interactions
	"Flexible, movable seating should be provided whenever possible. In addition, seating of various types should be provided in many different locations within the outdoor space: near entry and exit doors, near planned activity nodes (e.g., close to gardening beds), near ongoing daily activities (so that residents can watch the lawn being mowed, flowers being watered, etc.), in tranquil and private sections, and on the route of travel within the area (e.g., at various points along the wandering path)."	Cohen & Weisman, 1991, p. 79	Interesting views Support of functioning ability Autonomous and spontaneous outdoor use Private seats Social interactions Meaningful activity
	"The chairs, while inexpensive and easy to move, required very stable positioning to keep them steady, especially as clients seated themselves and stoop up."	Lovering et al., 2002, p. 424	Safe furniture
	"Rocking chairs on the porch often entice reluctant residents outdoors to rock and watch the activities in the garden. A cup of coffee or tea, snacks or food on the porch can be incentives or first steps to the walking path and other activities. "	Brawley, 2007, p. 278	Sensory experience Familiar furniture
Two-person bench Picnic table	"Bench and places to shade patients should be planned."	Pachana et al., 2003, p. 9	Micro-climatic comfort
	"If benches are provided they should have backrests along the entire length and at least one armrest. Seating should have adjacent space that allows shoulder-to-shoulder seating for someone using a wheelchair."	York, 2009, p. 205	Safe furniture Wheelchair accessible seating
	"There are no benches in the walkways to allow repose for residents with impaired ambulation or physical deconditioning."	Detweiler et al., 2005, p. 43	Support of functioning ability
	Two-person sitting space should be provided for private conversation.	Silverstein & Flaherty, 2003;	Privacy
	"Picnic tables should allow space for use by someone in a wheelchair and be located on a firm, stable and level surface. Accessible picnic tables should provide a knee space of at least 27 inches high, 30 inches wide, and 19 inches deep."	York, 2009, p. 205	Safe furniture Wheelchair accessible seating
	"Cognitively impaired residents were not able to enjoy the barbecue in the garden by themselves."	Heath & Gifford, 2001, p. 41	Functioning assistance
	"Two wooden benches with backs and arms are a perfect size for two people to occupy for a private conversation or for one person to claim by sitting lengthwise with his or her feet up."	Marcus & Barnes, 1999, p. 178	Privacy Safe furniture
	"The lighting had been added to allow use of the garden in the evenings..."	Lovering et al., 2002, p. 420	Safe environments

Outdoor lamps	"With the outdoor lights on, there was the stimulus for the residents to try to find the garden doors...leaving the garden lights on with the doors closed may have increased sun downing..."	Detweiler et al., 2005, p. 43	Regulation of stimulation Safe environments
	"The bright sunlight and the glare from the white concrete walkways throughout the outdoor garden are barriers for residents who had cataracts and other sight impairments."		
	"The pavilion can be screened and include lighting and a fan for ventilation."	Brawley, 2007, p. 278	Micro-climatic comfort Safe environments
	"A combination of outdoor lighting fixtures such as flood lights, spotlights and landscape lighting and the use of full spectrum bulbs will enhance nighttime visibility and safety. Good lighting can help to prevent falls and assist those who are visually impaired detect boundaries."	York, 2009, p. 206	Safe environments

Bird feeder Bird houses Bird baths	"A viewing platform overlooks the Australian bush, a finch aviary, a woodpile, a quiet area with a water feature and raised growing beds where residents can dig and pick produce"	Edwards & Gustafsson, 2008, p. 499	Sensory stimulation Reminiscent Meaningful activity
	"Residents made comments about the birds outside in wintertime and that they often saved breadcrumbs to feed the birds. Everyone appreciated when visitors brought their dogs."	Bengtsson & Carlsson, 2006, p. 7	Sensory stimulation Familiar activity
	"Abundant plantings, flowers, trees, birdbaths, and fountains created an idyllic setting where butterflies flourished and families and residents visited."	Cutler & Kane, 2005, p. 42	Sensory stimulation
	"There are several bird feeding stations (small birds only) and two raised planters specially designed for wheelchair accessibility."	Hoover, 1995, p. 7-8	Sensory stimulation Enhanced competence
	"There are "positive outdoor distractions such as walking paths, gardening, bird watching or fishponds."	York, 2009, p. 202	Sensory stimulation
	"The more opportunities there are to sit and rest the more likely it is that older adults will get out and walk. It pays to provide plenty of comfortable seating along walking paths, allowing places to rest, places to enjoy watching birds at the feeder."	Brawley, 2007, p. 277	Sensory stimulation
	"Care should be taken to extend the noninstitutional image and scale of the facility to the outdoors through such devices as small groupings of familiar outdoor furnishings and provisions for pets, birdfeeders, etc."	Cohen & Weisman, 1991, p. 75	Sensory stimulation Familiar settings

Flag Sculptures Farming	"Memory boxes, a tinka car, a mural of the local headland...a woodpile" are used to "elicit pleasurable explicit and implicit memories and encourage engagement"	Edwards & Gustafsson, 2008, p. 500	Sensory stimulation Reminiscence
--	--	---	-------------------------------------

equipment	<p>"A woodpile, compost heap, and tool shed will provide high levels of stimulation and would all be considered traditional adult male characteristics, while a laundry yard with a clothesline would be considered a traditional adult female characteristics."</p> <p>"A focal point, that of a Grecian urn, is found in the middle of this garden, always serving as a place of reference while providing for a sense of orientation."</p>	Hoover, 1995, p.6	Sensory stimulation Familiar settings Visual cues
	"Simple layout and distinctive landmarks (e.g., trees, sculptures, gazebos, arbors, fragrant gardens) visible at short distances may also assist individuals in finding their way independently."	Lovering et al., 1990, p. 38	Visual cues
	Art, sculpture and other human-made design elements should not be abstract and ambiguous but convey positive and clear messages.	Ulrich, 1999;	Sensory stimulation Information awareness

Barbecue Basketball net Game equipment	"A basketball net, play court, and future putting green would be considered traditional young adult activities and would be consistent with the guideline, stimulation without stress."	Hoover, 1995, p. 7	Sensory experience Familiar settings Meaningful activity
	Playground equipment or game tables encourage outdoor space utilization.	Cohen-Mansfield, 2007	Sensory experience Familiar settings

Trellis Lattice Container Plant supplies	"Arbors, a flower or vine covered trellis, plants, and groupings of plants surrounding a bench can all be used to create private spaces outside."	Brawley, 2002, p. 10	Enclosed sitting
	"Vertical gardening or trellis can be used in areas that may lack space and can accommodate varying needs combining multi-generational as well as multi-ability opportunities for gardening. Planters can be placed on an accessible pulley system so individuals can lower the hanging baskets in order to reach and water the plants."	York, 2009, p. 205	Sensory experience Accessible gardening Meaningful activity
	"Trees or trellis can define a space; it shelters one from the intense sun; and it filters light to create a more gentle effect. This can be particularly satisfying when used at the entry of a building to create a transition between a relatively dark space to bring sunlight. This aspect is particularly important to older individuals whose eyes may be sensitive to glare."	Beckwith & Gilster, 1997, p. 10	Micro-climatic comfort Safe adjustment of lighting Recognizable space
	Residents are allowed to select their preferred plant(s) in named containers.	Lee & Kim, 2008	Personalized gardening

Hat &	A shed provides storage space so tools and furniture will not	Lovering et al.,	Safety and
------------------	---	------------------	------------

cushion storage box Storage shed	block pathways or patios.	2002, p. 420	security
	"The lack of storage facilities was an inconvenience and a safety concerns for clients and staff. Throughout the summer the north end of the terrace and a portion of the west wall were blocked by the storage of furniture and equipment that limited the available space for programming and resulted in cramped seating and walking arrangements."	Lovering et al., 2002, p. 424	Safety and security
	"Each of the twenty residents on the unit had a sun hat that was conveniently located on the wall adjacent to the door leading to the patio."	Cutler & Kane, 2005, p. 42	Safety and security Visual cues

Toilet Drinking fountain	"Washrooms were not in close proximity to the outdoor space. This created problems for staff, who had to interrupt an activity and leave clients alone as they helped someone to go indoors to the washroom."	Lovering et al., 2002, p. 424	Monitored environments Independence use of bathrooms
	It is important to provide easy access to a bathroom and a drinking fountain. "Given the great difficulty that moving residents from their units imposes on staff members, solving the problem of accessibility is of utmost importance."	Cohen-Mansfield, 2007, p. 50	Safe environments (prevention from dehydration) Easy access to washrooms
	"Provision of outdoor washroom facilities is an added bonus" to outdoor gardens.	Cohen & Weisman, 1991, p. 75	Safe environments Easy access to washrooms

Directional signs Name tags	Poor utilization seems to be linked with a lack of signs orienting the way to the garden and a lack of awareness and encouragement to use the garden.	Heath & Gifford, 2001, p. 41	Awareness and wayfinding
	Specific signs that indicate direction and location of garden space should be provided.	Zeisel, 2007;	Wayfinding and orientation
	A map in resident or patient's information packet should be included.	Sheehan et al., 2006;	Information awareness

Display shelf or billboard	A display shelf that contains personally meaningful mementoes helps personalize space and create positive impact on orientation.	Calkins 2003	Sense of ownership
---------------------------------------	--	--------------	--------------------

Tool Plant supplies	"Many adaptive products are available to assist individuals with gardening who may have difficulty using traditional tools...Tool modifications may include wrist supports, light weight design, ergonomically designed handles, longer handles for reaching etc."	York, 2009, p. 206	Accessible gardening
------------------------------------	--	--------------------	----------------------

Water pond or fountain	There is " a quiet area with a water feature and raised growing beds where residents can dig and pick produce"	Edwards & Gustafsson, 2008, p. 500	Sensory stimulation
	"The fountain provides an interest point."	Lovering et al., 2002, p. 420	Visual aesthetics
	"Water features that residents do enjoy watching also can be a potential hazard for them, because cognitively impaired residents might climb or fall into the water."	Heath & Gifford, 2001, p. 41	Visual aesthetics Safe outdoor feature
	"Abundant plantings, flowers, trees, birdbaths, and fountains created an idyllic setting where butterflies flourished and families and residents visited."	Cutler & Kane, 2005, p. 42	Sensory stimulation
	"A water feature would provide both visual and auditory interest."	Kearney & Winterbottom, 2005, p. 24	Sensory stimulation
	"The therapeutic planting boxes, garden furniture, and fountains function as a landmark to the residents, especially to the elderly with dementia."	Lee et al., 2007, p. 13	Wayfinding and orientation
	"There are "positive outdoor distractions such as walking paths, gardening, bird watching or fishponds."	York, 2009, p. 202	Visual interests
	"For individuals with Alzheimer's disease, the aesthetic appeal of an attractive fountain can be extremely effective in a garden. Hearing the gentle murmur of a stream of water is also soothing. "	Beckwith & Gilster, 1997, p. 8	Sensory stimulation
	"Water features located in well-landscaped outdoor spaces offer visual, tactile, and auditory stimulation.	Cohen & Weisman, 1991, p. 75	Sensory stimulation

Fence	"Outdoor gardens should have a sturdy, secure fence or other enclosure, to prevent unwanted entry or exit from the area. However, bare, high chain-link fencing can increase the feeling of entrapment and should be disguised with planting, if possible."	Pachana et al., 2003, p. 9	Safety and protected outdoor space
	"The fence of wide planks prevented outsiders from coming too close to the residents" makes residents feel safe.	Bengtsson & Carlsson, 2006, p. 5	Safety and security
	"Providing outdoor spaces connected to special care units provide both a challenge and an opportunity. The challenge is to create a secure outdoor space that doesn't provide a view beyond the space because often residents will make an effort to elope beyond the parameters of the space. A very common mistake is to fence the area with a see-through material such as metal chain link."	Cutler & Kane, 2005, p. 41	Safe and camouflaged fence
	"Gardens must be safely enclosed by a fence or a wall. The challenge is to create an enclosed space without the feeling of confinement... The goal is to provide secured spaces that encourage a variety of activities without causing a sense of feeling "fenced in.""	Brawley, 2007, p. 271	Enclosed environments Autonomous and spontaneous activity
	A white picket fence reflect a more traditional, overall idea of a New England home.	Hoover, 1995	Home-like features

<p>To ensure safety, the use of a wall or fence is necessary.</p> <p>"Trees and garden structures should be located far enough away from the enclosure to discourage their use as climbing aids. While walled gardens may be necessary, the challenge is to create an enclosure without the feeling of confinement. Gate and locks require camouflage to minimize attention by residents."</p>	<p>Lovering, 1990, p. 36</p>	<p>Safe and camouflaged fence</p>
<p>"For the individual with Alzheimer's disease, the walled or fenced space serves as a refuge... It provides a safe and secure space for exercise, walking and wandering, gardening and socializing. It allows contact with nature, while at the same time defining the limits of the space."</p>	<p>Beckwith & Gilster, 1997, p. 8</p>	<p>Safety and security Recognizable and distinctive space</p>
<p>"Attention should be paid to the nature of the enclosure; unlike functional chain link fences, boundaries defined by plants or the configuration of the building mass are typically unobtrusive and have the same potential effectiveness."</p>	<p>Cohen & Weisman, 1991, p. 77</p>	<p>Safety and security Home-like features</p>

Appendix B: Experiential Themes Derived From Descriptions of Organizations in Literature

Organizational factors	Descriptive or evidence-based finding	Reference	Experiential theme
<i>Organizational philosophy & culture</i>			
Value	It is a challenge to "care for persons who suffer from complex cognitive and medical disabilities, habits established in residential facilities over the years, the perception that medication is easier to administer, and a system that does not address the quality of living with dementia from a holistic point of view" prevail over nursing facilities.	Cohen-Mansfield, 2004, p. 305	Individualized care
	"The most important implication for nurses is the need to consider the culture of the caring environment." Multiple-sensory experience adds quality to resident everyday lives. "Facilities that include Snoezelen rooms and garden areas are important because they have the potential to There is a need for nurses to remember that, despite the busyness of the day and the focus on tasks, quality of life is important and enhancing quality of residents' lives is a value that drives nurses' caring work. Anything that helps nurses connect to that value is critical."	Cox et al., 2004, p. 44	Multiple-sensory experience
	One program director's philosophy "that such programmed use of the garden would detract from the garden's being a place of respite was reflected in the absence of any programmed or staff-initiated use of the garden by residents... it seems probable that a change in this aspect of organizational policy to a more active influence on residents' use of the outdoor space through programmed group activities would increase the amount of overall use of the garden by residents" and another shows "very controlled outdoor use by residents with no use of the outdoor space by day clients... it would seem that a modification of the organizational policy to encourage independent use of the garden by day clients would be advisable."	Grant et al., 2007, p. 110	Self-initiated use; Participation of group activities

Structures	<p>"The nursing home's design, practices, schedule, and other system characteristics can also impede the implementation of nonpharmacologic interventions, even when the intervention would be more cost-effective in the long run. For instance, interventions with pet therapy would be much easier and more widely utilized if a pet lived on the premises, rather than having staff constantly schedule pets to be brought to the facility. However, implementing an on-site pet therapy program would require a system change. Many other interventions can be maximized via a system rather than a topical change."</p>	Cohen-Mansfield, 2004, p. 305	Accessible resource; High awareness of resource
Communication (inter-group relations)	<p>"There were also instances during the course of the study when the organizational policy of the facility did not translate into the reality of the situation—particularly with regard to encouraging independence and including a variety of programmed outdoor activities."</p> <p>"It appears that the mission statement affects use of the outdoor space only if an objective of encouraging residents to use the outdoor space is derived from it, clearly instilled among staff, and reflected in programming policy."</p>	Grant et al., 2007, p. 110, 114	Free access; Participation of group activities; Increase of interests; Individualized and meaningful activity
Outdoor program			
	<p>"The planned activity (which was the means to get people to spend time outdoors) had to be modified to be more individualize-based than group" so there will be more people to use outdoor space, and they will spend longer time.</p>	Calkins et al., 2007, p. 226	Individualized activity
Individualization	<p>To maximize effect of outdoor intervention, "an alternative approach is to individualize the intervention within a framework of planned activities, with planned adaptations specified in advance for how activities are to be offered to individuals as a function of a participant's preserved cognitive ability, sensory impairment and motor function (range of motion, grasp)"</p>	Connell et al., 2007, p. 207	Individualized activity
	<p>"The greatest influence on positive affect was the one-on-one attention of the nurse. The risk is that if busyness and tasks dominate and nurses are not motivated to spend non-task, quality time with</p>	Cox et al., 2004, p. 44	One-on-one activity

residents, and any environmental enhancement—however well-intentioned—will simply lie idle."

	"Outdoor space use by residents with dementia is far more likely to occur if structured activities programming is provided and staff are available to assist residents in going outdoors, offer activities that are meaningful to them, and provided them with the appropriate level of assistance to keep them engaged."	Connell et al., 2007, p. 199	Meaningful participation
	"Nurses may also encourage owners and managers of nursing homes to consider ways in which they could incorporate gardens that are "resident friendly," that is, gardens that can be more than just viewed. This study clearly indicated the pleasure that residents derived from digging, hosing and being engaged in some way with the garden."	Cox et al., 2004, p. 44	Meaningful and active participation
	Outdoor environments should be programmed as "fun, interesting gardens provide meaningful activity choices, somewhere to go and something to do while encouraging socialization and inclusion."	Brawley, 2007, p. 273	Choices of meaningful activity
	In many cases, gardening activities and provision of raised beds are not a priority of administrators, or staff have no time and interests leading outdoor activities.	Dahlkvist et al., 2014	Accessible natural material; Meaningful and active participation
	"To remedy the low incidence of child use, hospitals should include programs that actively encourage garden use by children and families, since this study demonstrates that once there, children will use the garden features most actively, with almost half playing in the gardens and engaging in interactive activities with natural and structural elements."	Sherman et al., 2005, p. 181	Group participation; Active interactions
Activity setting	"The actual extent to which and the way spaces are used depends on facility policies (including policies on permitting residents to be outside on their own), and facility practices such as having outdoor barbecues, encouraging family to go outside with residents on the grounds and making sure that seating and tables are clean, dry, and in good repair."	Cutler & Kane, 2005, p. 45	Safe seating areas; Social interactions; Familiar outdoor activity
Regularity	To make residents go outside regularly, "regular	Cohen-	Predictable

	outdoor time needs to be scheduled from the beginning of the nursing home stay."	Mansfield & Werner, 1998, p. 435	outdoor schedule
	"Integrating nature and the use of natural spaces in the facility curricula or activity planning could increase nature interactions among the residents. Care providers in facilities that have integrated nature walks and scheduled social activities in the outdoor spaces in their curricula, indicated that nature interactions occurred quite frequently."	Kearney & Winterbottom, 2005, p. 23	Predictable outdoor schedule
	"Gardens expected to be utilized as part of the overall therapeutic program must be woven into the care plans developed by the clinical staff...Developing a strong outdoor activity program before—not after the garden is designed and built is the foundation that determines how the design can best support activities and ultimately, the residents. A successful garden is one that becomes a part of residents' lives and is constantly used."	Brawley, 2007, p. 275	Predictable outdoor schedule
Outdoor Policy			
	"Nursing staff reluctant to allow residents to use the garden was the lack of cameras to monitor the garden (perimeter walkway did have monitoring cameras). Therefore, the garden was often closed due to the increased fear of having a fallen resident be left in the garden for prolonged intervals before being found when there was not sufficient nursing staff to visually monitor residents in the garden."	Detweiler et al., 2008, p. 43	Independent visit
Free access	"The actual extent to which and the way spaces are used depends on facility policies (including policies on permitting residents to be outside on their own), and facility practices such as having outdoor barbecues, encouraging family to go outside with residents on the grounds and making sure that seating and tables are clean, dry, and in good repair."	Cutler & Kane, 2005, p. 45	Independent visit; familiar activities and social interactions
	"Despite the positive comments from the staff regarding the garden and its benefits, resident access was limited not only to the doors being locked, but because they were locked, when staff had the time to take them. This was a	Hernandez, 2007, p. 141	Free access

sore subject amongst staff."

	"...there was an alarm connected to the doors which sounded if a door was opened without a key, the doors were not kept locked during the day. It is possible that the removal of the alarm as a deterrent to independent use would increase such usage by day clients."	Grant et al., 2007, p. 112	Free access
Surveillance	"It is important for staff to keep residents in view and the use of larger windows provides greater visibility to the outside and helps alleviate staff stress. It is important to develop policies of shared risk."	Brawley, 2007, p. 273.	Monitored space; Awareness of space being monitored
Smoking	In the study site, "smoking within the courtyard has been prohibited, presumably because having buildings on all four sides means that wind cannot move and clean the air continuously. Those who might have used the space to smoke have to go elsewhere. This is a good policy from a health point of view for smokers and nonsmokers alike and should be continued."	Cranz & Young, 2005, p. 84	Sensory stimulation
Gardening	"Because of the popularity of allotment gardening and the direct physical activity it encourages, we recommend creating another strip of allotment gardens, and support continuing the policy of offering alternative spaces for those on the waiting list."	Cranz & Young, 2005, p. 87	Sensory stimulation; Responsibility of caring plants; Meaningful and active interaction

Resources

Financial resources	The utilization of nonpharmacologic interventions such as outdoor gardens in practice is limited. "The biggest barrier is the lack of financial resources, or, stated otherwise, the lack of reimbursement. Whereas the use of psychotropic drugs is directly reimbursed, utilization of nonpharmacologic approaches is not."	Cohen-Mansfield, 2004, p. 305	Multiple sensory experience
Staff in assistance	"Nursing staff reluctant to allow residents to use the garden was the lack of cameras to monitor the garden (perimeter walkway did have monitoring cameras). Therefore, the garden was often closed due to the increased fear of having a fallen resident be left in the garden for prolonged intervals before being found when there was not sufficient nursing staff to visually monitor residents in the	Detweiler et al., 2008, p. 43	Monitored environment

garden."

	"The most frequently mentioned hindrance related to outdoor visits was lack of assistance. Walking difficulties are associated with mobility and also accessibility of the environment, which makes residents more rely on staff assistance. "	Rappe et al., 2006, p. 58	Accessible outdoor space
	"Beautiful outdoor spaces were built, often with community support, but it was unrealistic to think that residents could make use of the spaces, either independently because of their distance from resident rooms or with the assistance of staff because of the time required to assist residents to the space."	Cutler & Kane, 2005, p. 43	Accessible outdoor space
	"There were reductions in the recreational staff that decreased the opportunities to assist getting residents into the garden"	Detweiler et al., 2008, p. 43	Accessible outdoor space
	In many cases, "less common were activities intended to train residents' fine and gross motor skills. The most frequent activities in the garden were just sitting in it and having common meals/snacks."	Dahlkvist et al., 2014, p. 101	Accessible natural material; Meaningful and active interaction
Maintenance	"Staff viewed the maintenance as an added burden on them and expressed a feeling of guilt if plants died and the grass was not cut."		
	"A structured garden-care plan for regular maintenance, including the replacement as required of those plants in decline, is essential for the success and longevity of the garden. A resource manual for maintenance staff may be helpful, especially as the garden relates to program requirements.	Lovering et al., 2007, p. 424-425	Sensory stimulation
	"One staff member expressed frustration because she felt that she had no one to help her; she felt it was important to have the garden "looking nice", but this could only be at the expense of time spent with clients. Staff identified a need for cooperation from maintenance crews. They felt that the maintenance program needed to be integrated with the program as a whole and the time allotted for planning with the maintenance department was important to determine roles, responsibilities and problems to be addressed. "	Lovering et al., 2007, p. 424	Sensory stimulation

Appendix C: Experiential Themes Derived From Descriptions of Staff

Practice in Literature

Staff variables	Descriptive or evidence-based finding	Reference	Experiential theme
<i>Decision-making process</i>			
Selection of a course of action	"It became evident during the case studies that staff attitudes were an important ingredient in encouraging residents to go outside and allowing residents a degree of independence and risk taking."	Grant et al., 2007, p. 110	Prevention of falling; Meaningful and self-actualized activity
	"Staff have insecurity about letting the residents be out on their own. They think there is a risk of someone suffering from dementia wandering off if there was insufficient supervision; people could fall outside on stairs or into the pond, especially during the winter season when it was slippery and the plants around the pond had not yet grown."	Bengtsson & Carlsson, 2006, p. 5	Prevention of falling
<i>Role and responsibility</i>			
Who are gardeners?	"One staff member expressed frustration because she felt that she had no one to help her; she felt it was important to have the garden "looking nice", but this could only be at the expense of time spent with clients. Staff identified a need for cooperation from maintenance crews. They felt that the maintenance program needed to be integrated with the program as a whole and the time allotted for planning with the maintenance department was important to determine roles, responsibilities and problems to be addressed. "	Lovering et al., 2007, p. 424	Sensory stimulation
	"The question of who will care for the plants should be given careful consideration. Some gardening projects in which patients with dementia have cared for plants have had positive results (Pachana, 1995). However, an unstructured therapeutic endeavor can become a burden on patients."	Pachana et al., 2003, p. 9	Predictable workload and schedule; Sensory stimulation Meaningful activity
	"Gaining the interest and cooperation of all ward staff is vital to ensure the success of the project...It is prudent to seek expert horticultural advice on the types of plants that work best in the chosen setting, and which do not pose a risk of accidental poisoning. Ideally, the plants should be easy to care for and tolerant of occasional neglect."	Pachana et al., 2003, p. 9	Safe and tolerant plants
	"Social workers should be prepared to play an active	Raske,	Accessible

	role in the development, implementation, and evaluation of programs, such as enabling gardens, that improve resident lives. A key role is brokering relationships that tap resources, such as community clubs and organizations, skilled volunteers, and funding sources... From a practice perspective, family members could be more actively engaged in accompanying residents to the garden during their visits, thus providing more time for residents to interact with natural settings and further enhance their quality of life."	2010, p. 349	resources Social contact
	"In many cases, the staff was responsible for maintenance of the garden/patio at the facilities, and the residents were seldom involved in gardening."	Dahlkvist et al., 2014, p. 101	Autonomous participation
<i>Staff training and education</i>			
Knowledge of care for different needs	"Additional barriers include lack of knowledge by caregivers as to how to care for persons who suffer from complex cognitive and medical disabilities, habits established in residential facilities over the years, the perception that medication is easier to administer, and a system that does not address the quality of living with dementia from a holistic point of view."	Cohen-Mansfield, 2004, p. 305	Individualized activity
Skill in utilizing garden resource	"Although staff were generally appreciative of the garden, the individual level of comfort and skill in understanding and using the opportunities of the garden varied. As one said, "Some staff aren't as green thumbed as others and they like to do the programming out there but they don't necessarily want to do gardening programming." The creativity involved in planning and implementing garden-based programs added to the complexity and challenge of their work." "Staff who took leadership in the garden were those who themselves enjoyed gardens as part of their personal lifestyles." "Staff themselves identified their lack of training or knowledge in outdoor programming"	Lovering et al., 2007, p. 425	Sensory stimulation Active and meaningful participation
	"To maximize the use of the garden for people with AD, staff need to have an understanding of the natural environment and its potential for complementing indoor programs through outdoor activities. Staff training would help optimize the potential of the garden for enriching service provision. Provision of a manual that documents appropriate activities for use of the garden are needed to assist those who are unfamiliar with the potential of the outdoor environment."	Lovering et al., 2007, p. 427	Sensory stimulation Active and meaningful participation
	"Brief tenure of facility staff at each site influenced their ability to implement a person-centered approach."	Jarrott & Gigliotti,	Verbal cues or visual aids of

Further, one of these facilitators (horticultural therapists) was training to be a horticultural therapist but did not have experience working with persons with dementia. Although their skills complemented each greatly in the full group setting, when the facilitators worked individually with smaller groups, their lack of cross-training may have affected their ability to support participants' achievement of optimal fit.	2010, p. 663	activity; Sensory stimulation Individualized activity
"Staff knowledge and concerns for safety are a crucial part of access to and use of outdoor areas for people with dementia. This is an important area for education...Nurses and other caregivers in the multiple care environments that provide services for people with dementia need to expand their understanding of the importance and meaning of experiences of the natural environment for the people with dementia."	Bossen (2010, p. 21)	Active and meaningful participation
"Efforts should also be made to increase awareness among staff of the benefits of nature interaction and the importance to the patient of such interaction. Such increased awareness may encourage staff assistance in helping residents reach outdoor nature spaces, thereby facilitating resident access."	Kearney & Winterbottom, 2005, p. 23	Accessible natural resource

Appendix D: Evaluation Tool for Physical Settings of Pilot Cases

Name of Nursing Home: _____

Scoring System:

- 1= Poor
- 2= Fair
- 3= Good
- 4= Very good, could be improved
- 5= Very successful

SPATIAL PROPERTIES

Location & orientation

- ☐ The outdoor settings are located at the same floor with bedrooms, and the distance from furthest room to the garden is less than 100 feet.
- ☐ Few decision points are encountered from bedrooms to the outdoor space.
- ☐ The outdoor space faces south to support growth of different types of plants.

Spatial connection

- ☐ The outdoor space is visually connected with public areas such as nurse stations, activity rooms and OT/PT rooms so staff can make supervision from work places.
 - ☐ The outdoor space is visually connected with bedrooms and public space such as corridors, activity rooms and lounge rooms so residents can easily receive outdoor information regarding the weather, time, seasons and ongoing activities while being in their daily routines.
 - ☐ Entry points are not located at space that may have behavioral conflicts between on-going activity participants and potential outdoor users (Desires of using outdoor space is not delayed by ongoing activities).
 - ☐ Entry points are located at a space with environmental cues such as pictures windows with view out toward gardens, indoor plants and landscape painting.
 - ☐ Entry points are adjacent to a landmark-like place such as a nurse station, chapel or activity alcove. They may guide residents to find their ways to the outdoor space.
 - ☐ There is a sun room or green house that has views out toward outdoor space without barriers so residents who prefer to stay inside have opportunities to observe nature.
 - ☐ There is a transitional space between indoor and outdoor areas (e.g., a porch) so residents can preview outdoor space before using it.
 - ☐ There is a transitional space (e.g., a porch) between indoor and outdoor areas to allow residents' eyes to adjust to different light.
-

☐

Residents are able to view or hear indoor activities from the outdoor space so residents may feel they are observed and they are not left alone.

☐

There is a garden space that is adjacent to a kitchen or dining room so residents may have chances to participate in and supervise preparation of garden-grown food.

Layout of outdoor space

☐

There is a clear path system for daily walk and patio space to stop for chat and gatherings.

☐

Several interesting places (garden space, gathering space, bird feeder areas etc.) are connected by the path.

☐

There are different types of patios for social gatherings like entrance patios and activity patios.

☐

There is a place that allows a group of people (8-10 wheelchair users) to occupy at the same time.

☐

There is a space adjacent to activity areas so residents can observe activities without direct participation.

Seating space

☐

There is availability of seating spaces located in different distance from entrances and a primary pathway.

☐

There are choices of seating space in shade and sun to avoid compelling conversation and to allow adjusting weather conditions to sustain a longer conversation.

☐

There are choices of seating spaces away from noise of traffic, ventilation, and air conditioners.

☐

Plants (screening foliage or branches) are provided to decrease visibility or give sense of enclosure in some seating area.

SENSORY PROPERTIES

Visual experience

☐

There are flowers with different colors to increase visual interests.

☐

Local plants are selected.

☐

There are opportunities to observe wild life (e.g., birds, butterflies)

☐

Path or concrete surfaces produce no glare.

☐

Landscape materials are presented in a variety of forms: plant containers, vine-climbing trellises, shrubs and raised beds.

Tactile & olfactory experience

☐ The space has raised beds, containers or hanging baskets that allows people to touch and smell plants from a wheelchair level.

☐ There is no cigarette smell or odor.

Taste experience

☐ There are garden-grown vegetables to provide taste experience.

Hearing experience

☐ There is a water feature to create water sounds

☐ The outdoor space is away from mechanic, air conditioner and traffic noise.

☐ There are nature sounds of birds.

BUILT FEATURES

Pathways

☐ There is a level pathway with raised edges to prevent wheelchairs from rolling into grass.

☐ The path is wide enough to allow two wheelchairs to pass (at least six feet).

☐ The path leads residents to different spots with different angels of view of the outdoor space.

☐ There is a level walkway that connects indoor and outdoor spaces

Furniture & Accessories

☐ There are movable and sturdy chairs that allow adjusting for group size and seating orientation.

☐ There are wheelchair accessible built features (e.g., automatic door, raised beds) to reduce dependence on staff assistance

☐ There are wheelchair accessible communication devices for emergency contact with indoor staff

☐ A drinking water fountain is placed to prevent dehydration.

☐ There are handrails along parts of pathways for those with balance problems.

☐ Provide maps and directional signs to increase awareness of outdoor space and its directions.

☐

A place is created for residents to display their artworks or hand-made decorative objects such as bird feeders.

☐

There are gardening supplies (e.g., plant support, shepherd hooks, fertilizers) based on needs of plants to enhance results of resident garden work.

☐

There are cultural symbols such as sculpture, flags and other decoration.

Outdoor structures

☐

There are shade devices or garden structures such as an arbor, trellis or pergola to provide protect from the sun and winds.

☐

There are visual reference points (e.g., gazebo, pergola) to facilitate navigation in gardens.

Appendix E: Variables of Physical Settings Derived from Literature and Their Groupings

	Spatial properties	Sensory properties	Built features
Sensory Stimulation	<ul style="list-style-type: none"> Visual connection with indoor spaces and within outdoor spaces Path systems Entry points Spatial variety Size or scale of activity sections Size or scale of green space Size or scale of gardening sections 	<ul style="list-style-type: none"> Visual: Plant materials and wild life Visual: Color or luminous contrast, shape or form of furniture or architectural façade and paving Auditory: Water sounds Auditory: Nature sounds Auditory: Noise Olfactory & Tasting: Plant materials: annuals, herbs & garden-grown food Tactile: Environmental temperature Tactile: Wind (air pressure) Tactile: Nature materials: plants, soil, water 	<ul style="list-style-type: none"> Raised bed/Planter/Sandbox Handrail/Ramp Umbrella table sets/Glider Pergola/Gazebo/Arbor /Solarium/Conservatory Shaded Terrace/ Porch Outdoor lamps Bird feeders/Bird house/ Bird bath Flag, sculpture, farming equipment Movable chair/bench Trellis/Lattice/Container Water pond/Water fountain

	Spatial properties	Sensory properties	Built features
Safe & secure environments	<ul style="list-style-type: none"> Visual connection with indoor spaces and within outdoor spaces Spatial variety Size or scale of activity sections Size or scale of green space 	<ul style="list-style-type: none"> Visual: Color or luminous contrast, shape or form of furniture or architectural façade and paving Tactile: Environmental temperature 	<ul style="list-style-type: none"> Pavement/Edges/Finishing Emergency alarm /Communication device/Monitor Raised bed/Planter/Sandbox Handrail/Ramp Umbrella table sets/Glider Pergola/Gazebo/Arbor /Solarium/Conservatory Shaded Terrace/ Porch Outdoor lamps Movable chair/bench Trellis/Lattice/Container Hat & cushion storage box/ Shed Toilet/ drinking fountain Water pond/Water fountain Fence

	Spatial properties	Sensory properties	Built features
Accessible space & built features	<ul style="list-style-type: none"> Location Path systems Entry points Spatial variety Width of walkways Size or scale of activity sections Size or scale of green space 	n/a	<ul style="list-style-type: none"> Pavement/Edges/Finishing Wheelchair touch pad/automatic door Raised bed/ Planter/ Sandbox Handrail/Ramp Pergola/Gazebo/Arbor /Solarium/Conservatory Shaded Terrace/ Porch Bird feeders/Bird house/ Bird bath Movable chair/bench Trellis/Lattice/Container Tool/Plant supplies

	Spatial properties	Sensory properties	Built features
Privacy	<ul style="list-style-type: none"> Visual connection with indoor spaces and within outdoor spaces Spatial variety Size or scale of activity sections 		<ul style="list-style-type: none"> Movable chair/bench Trellis/Lattice/Container

	Spatial properties	Sensory properties	Built features
Social Interaction	<ul style="list-style-type: none"> Path systems Spatial variety Size or scale of activity sections Size or scale of green space 	<ul style="list-style-type: none"> Visual: Plant materials and wild life 	<ul style="list-style-type: none"> Umbrella table sets/Glider Pergola/Gazebo/Arbor /Solarium/Conservatory Shaded Terrace/ Porch Movable chair/bench

Spatial properties	Sensory properties	Built features
--------------------	--------------------	----------------

Familiarity	<ul style="list-style-type: none"> Visual connection with indoor spaces and within outdoor spaces Spatial variety 	<ul style="list-style-type: none"> Visual: Plant materials and wild life Visual: Color or luminous contrast, shape or form of furniture or architectural façade and paving Olfactory & Tasting: Plant materials: annuals, herbs & garden-grown food Tactile: Nature materials: plants, soil, water 	<ul style="list-style-type: none"> Raised bed/Planter/Sandbox Shaded Terrace/ Porch Bird feeders/Bird house/ Bird bath Flag, sculpture, farming equipment Movable chair/bench Barbecue/Basketball net/Game equipment Fence
--------------------	---	--	---

	Spatial properties	Sensory properties	Built features
Information awareness and spatial orientation	<ul style="list-style-type: none"> Location Visual connection with indoor spaces and within outdoor spaces Layout Entry points Spatial variety 	<ul style="list-style-type: none"> Visual: Plant materials and wild life Visual: Color or luminous contrast, shape or form of furniture or architectural façade and paving Auditory: Noise 	<ul style="list-style-type: none"> Raised bed/Planter/Sandbox Umbrella table sets/Glider Pergola/Gazebo/Arbor /Solarium/Conservatory Flag, sculpture, farming equipment Trellis/Lattice/Container Hat & cushion storage box/ Shed Directional signs or name tags Water pond/Water fountain Fence

	Spatial properties	Sensory properties	Built features
Sense of ownership	<ul style="list-style-type: none"> Spatial variety 	n/a	<ul style="list-style-type: none"> Trellis/Lattice/Container Display shelf or billboard

	Spatial properties	Sensory properties	Built features
Participation in meaningful activities	<ul style="list-style-type: none"> Path systems Spatial variety Size or scale of activity sections Size or scale of gardening sections 	<ul style="list-style-type: none"> Visual: Color or luminous contrast, shape or form of furniture or architectural façade and paving Olfactory & Tasting: Plant materials: annuals, herbs & garden-grown food Tactile: Nature materials: plants, soil, 	<ul style="list-style-type: none"> Raised bed/Planter/Sandbox Pergola/Gazebo/Arbor /Solarium/Conservatory Bird feeders/Bird house/ Bird bath Movable chair/bench Barbecue/Basketball net/Game equipment Trellis/Lattice/Container

Appendix F: Physical Setting Checklist

SPATIAL PROPERTIES

1. Volume

- a. Location: _____, Orientation: _____, Shape: _____.
- b. Width: _____, Length: _____, Height: _____.
- c. Size: _____.

2. Paths:

- a. Is there any path to orient users and support outdoor walking? Yes: ☐ No: ☐
- b. If yes, what does it look like?
 - A shortcut between buildings ☐
 - A walking path ☐ (linear ☐ looped ☐ multiple-looped ☐)
 - A “just passing through” path ☐
- c. If yes, is there a visible and recognizable start and end point (e.g., an arbor or canopy is placed at a path entering point.)? Yes: ☐ No: ☐
- d. If yes, is there any destination (a gazebo or bench) along the way? Yes: ☐ No: ☐
- e. If yes, is there any clear edge between paths and lawns (e.g., curb, handrails, or planters)? Yes: ☐ No: ☐

3. Sections

- a. Is there a distinct boundary between spaces within the garden (e.g., separation by vegetation, furniture, or pavement pattern)? Yes: ☐ No: ☐
- b. Is there a public patio that can accommodate social gathering of three to four families? Yes: ☐ No: ☐
- c. Are there small and enclosed seating spaces with views out toward a larger and open space? Yes: ☐ No: ☐

4. Nodes

- a. Is there any seating space arranged around entry points of the garden? Yes: ☐ No: ☐
- b. Is there any crossroads in the garden? Yes: ☐ No: ☐
If yes, is there any seating space arranged around crossroads in the garden?
Yes: ☐ No: ☐

5. Border

- a. Is the garden enclosed? Yes: ☐ No: ☐
- b. Is it surrounded by any vegetation, structural or building edge? Yes: ☐ No: ☐
Please describe features of it (e.g., height and visual access)

- c. Is there direct access to the garden from interior spaces of the nursing home?
Yes: ☐ No: ☐
How many entry points from the interior spaces does the garden have? ☐
What are these interior spaces?

Is there direct access to the garden from other exterior space of the nursing home?

Yes: ☐ No: ☐

How many entry points from the exterior spaces does the garden have? ☐

What are these spaces?

- d. Is the garden visible from interior spaces of the nursing home? Yes: ☐ No: ☐

What are these spaces?

Is the garden visible from other exterior spaces of the nursing home? Yes: ☐ No: ☐

What are these spaces?

6. Landmarks

- a. Is there a prominent object to orient users or serve as a destination? Yes: ☐ No: ☐ Place describe features of it (e.g., types (structural or natural landmarks), height and visual access)

BUILT ENVIRONEMNT

Fixed

1. Floor

- a. What type of paving is used here?

Pebbles on cement ☐ Mortared stone ☐ aggregate concrete blocks ☐ brushed concrete ☐ Others _____

- b. Does the paving facilitate wheelchair movement? Yes: ☐ No: ☐

Why? _____

2. Door

- a. What type of door is installed here?

Sliding door ☐ Swing door ☐ Automatic door ☐ Automatic door with a wheelchair touch pad control ☐ Others _____

- b. Is any doorsill above the ground? Yes: ☐ No: ☐

3. Garden structure

- a. Is there any structure (e.g., ramp, rail) that supports movement? Yes: ☐ No: ☐

What is it? Where is it located?

- b. Is there any shade device or structure? Yes: ☐ No: ☐

What is it? Where is it located?

- c. Is there any plant support? Yes: ☐ No: ☐

What is it? Where is it located?

Is it placed at wheelchair eye level heights? Yes: ☐ (height: between _____) No: ☐
(height : between _____)

- d. Is there any water feature? Yes: ☐ No: ☐

Does water splash outside the feature, wetting the surrounding ground?

Yes: ☐ No: ☐

4. Planters

- a. Is there any structured fixed raised planter? Yes: ☐ No: ☐

Is it wheelchair accessible? Yes: ☐ (dimension : _____(l)x_____(w)x_____(h)) No: ☐

Movable

5. Furniture

- a. What type of furniture is placed here?

Plastic low back chair/table ☐ Aluminum folding chair/table ☐ Wood folding chair/table ☐

Mesh aluminum chair/table ☐ Mesh aluminum table/chair with seat cushions ☐

Wicker table/chair with seat cushions ☐

6. Raised planters/containers

- a. Is there any movable planter or container? Yes: ☐ No: ☐

How many? Where are they located?

Are they placed at wheelchair eye level height? Yes: ☐ (height: between _____) No: ☐
(height : between _____)

Are they wheelchair accessible? Yes: ☐ (dimension : _____(l)x_____(w)x_____(h))

No: ☐

7. Garden art

- a. Is there any sculpture or culture artifact? Yes: ☐ No: ☐

Are they placed at wheelchair eye level height? Yes: ☐ (height: between _____) No: ☐
(height : between _____)

SENSORY PROPERTIES

1. Visual

- a. _____percentage of lawn landscape

- b. What is the major type of planting here?

Perennial ☐ Annual flower ☐ Vegetables & fruits ☐

- c. How many different colors of flowers are found in the garden? ☐

- d. Are these flowers placed at wheelchair eye-level heights? Yes: ☐ (height : between _____)
No: ☐ (height : between _____)

- e. Is there glare or reflections on the screen in sunlight? Yes: ☐ No: ☐

2. Auditory

- a. What is the average amount of decibels heard during the observation? ☐ db
- b. What is the quality of the sounds?
Discordant ☐ Neutral ☐ Pleasing ☐
- c. What are sources of the sounds?
Ventilation ☐ Traffic ☐ Yelling ☐ Crying out ☐ Fountain ☐
Radio ☐ Talks ☐ Animals ☐ Others _____

3. Olfactory

- a. What smells do you find in the garden?
None ☐ Urine ☐ Detergent ☐ Flowers ☐ Vegetables/herbs/fruits ☐ Food ☐
- b. Do you have to bend down to smell the odors of flowers or vegetables?
Yes: ☐ No: ☐ N/A: ☐
- c. What is the quality of smells in the garden?
Pungent ☐ Neutral ☐ Pleasing ☐

4. Taste

- a. What sources may provide taste stimulation in the garden?
None ☐
Herbs ☐
Vegetables/Fruits ☐
- b. Can vegetables or fruits be picked up by a wheelchair user?
Yes: ☐ No: ☐ N/A: ☐

5. Tactile

- a. What sources may provide tactile stimulation in the garden?
None ☐
Plant leaves ☐
Natural material (e.g., soil, water, sand) ☐
- b. Are some of these sources placed at wheelchair accessible levels?
Yes: ☐ No: ☐
Describe how wheelchair users may reach these sources

Appendix G: Courtyard Audit Tool for Physical Settings

Please rate the following statements regarding physical settings of the courtyard on a scale from 1 (Poor) to 5 (very successful).

- 1= Poor
- 2= Fair
- 3= Good
- 4= Very good, could be improved
- 5= Very successful

1. Privacy

Spatial

☐ Seating/activity alcoves are located in different distances from entrances and from a primary walkway.

☐ Provide small and enclosed seating spaces with views out toward a larger and open space.

Built

☐ There is movable furniture that allows residents and family members to arrange the settings with their preferred privacy level.

☐ Trellis (with screening foliage) or container plants are provided to decrease visibility of some seating areas.

2. Social Interaction

Built

☐ Provide movable furniture to allow adjusting for group sizes and seating orientation.

☐ Provide table and chair sets for group (four to six persons) or for two-persons gathering.

☐ There is a pergola, gazebo, solarium or shading device allowing planned activities or spontaneous social interactions to continue without influence of the weather.

Spatial

☐ Provide different choices of seating spaces (shade & sunny, individual & group, near-entrance & remote seats) for various social events.

☐ Walk paths connect different seats areas and give walkers and watchers an opportunity of conversation and greeting.

☐ Provide patio space that allows staff to deliver a large scale social event (> 20 wheelchair participants).

Sensory

-
- ☐ There are different types of plants with a variety of colors to cue residents to go outdoors and conversation.
-

3. Accessible space and built features

Spatial

- ☐ The courtyard is located at the same floor with resident rooms and next to living areas or major activity spaces.
- ☐ Entry points create no conflict between participants in an on-going activity (e.g., people who are having lunch) and potential outdoor users.
- ☐ Provide a walkway that allows two wheelchairs to pass (at least six feet) without rolling into grassy areas.
- ☐ Sufficient activity space is provided to allow movement and transportation of groups of walkers and wheelchair users.
-

Built

- ☐ Provide wheelchair friendly features (e.g., automatic door, flat threshold of entry door, handrails, smooth surfaces) to maximize functional abilities.
- ☐ Provide wheelchair accessible features to maximize outdoor enjoyment (e.g., accessible pergolas, picnic tables with a knee space, reachable bird feeders)
- ☐ There are raised beds and prosthetic garden tools allowing residents to take care of plants.
-

4. Sensory stimulation

Spatial

- ☐ Visual access to green environments is available in resident rooms and public areas.
- ☐ Outdoor activity areas for residents are at least 25 square feet per bed.
- ☐ Provide a transitional space between indoor and outdoor areas (e.g., a porch) to allow residents to sit, view, smell and enjoy sunlight.
- ☐ Provide gardening space and a space adjacent to it so residents can engage in gardening or observe gardening activities without direct participation.
- ☐ Provide walk paths that leads residents to different destinations with interesting views.
-

Sensory

- ☐ A garden is planted with flowers in a variety of colors for visual delight.
- ☐ There is a water feature to provide both visual and auditory interests.
-

☐ There is a quiet outdoor place to avoid excessive noise and crowding.

☐ Plants are selected for aroma or ability to attract wildlife.

☐ Vegetables are planted to provide olfactory stimulation and to allow residents to taste garden-grown food.

Built

☐ Provide raised beds, containers or hanging baskets that allows people to observe details of plants, touch and smell plants from a wheelchair level.

☐ Chairs and tables are provided to allow residents to observe nature (i.e., watching birds, rabbits)

☐ Provide wheelchair accessible birdfeeders or game equipment for positive distraction.

☐ An atrium or sunroom overlooks gardens, which can be opened to the air, smells and sunlight from the gardens.

☐ A sheltered pavilion or shaded patio provides cover from the weather to maximize micro-climatic comfort.

5. Safety and security

Spatial

☐ A natural surveillance is created in the courtyard because staff uses garden paths as a shortcut between buildings. Residents are able to seek immediate help from passing staff.

☐ The courtyard is visible from nurse stations, corridors, and activity rooms so staff can monitor the courtyard while conducting a daily work routine. Residents can also see staff close by and hear sounds coming from indoors.

☐ There is a transitional zone that offers physical protection from inclement weather and also visual adjustment for residents with sensitivity to glare.

☐ There is green space that is level, firm and regularly mowed and provides additional pathways for residents to enjoy the fresh cut grass.

Sensory/Built

☐ Walkways have clear edges, nonslip surface and good contrast with surrounding pavements.

☐ There is tinting concrete to enhance safety by reducing glare.

Built

☐ There is a monitor or wheelchair-accessible emergency communication device in outdoor space.

☐ There are shade devices or garden structures to provide protection from the sun and winds.

☐ There is a wheelchair-accessible drinking fountain and washroom near the courtyard.

☐ Outdoor chairs are sturdy, stable and comfortable, allowing residents to get up and out of them safely.

☐ Outdoor gardens have a sturdy fence or wall to prevent unwanted entry or exit.

☐ There are raised planters that allow residents to sit or stand while gardening rather than bending down their body to reach plants.

6. Familiarity

Spatial

☐ There are large windows to allow residents to view garden space and outdoor activities to promote positive reminiscences.

☐ The courtyard garden is adjacent to the kitchen or activity rooms so residents have opportunities to observe or participate in preparation of garden-grown food.

Built

☐ Provide garden structures (e.g., trellis), furniture and decoration (e.g., birdfeeders, sculptures) that are familiar in the locality.

☐ There is a porch that encourages residents to engage in familiar activities such as having tea time, watering plants, or observing nature.

Sensory

☐ Plants are selected with which residents are familiar.

☐ Edible plants are chosen for gardening activities and tasting events using resident's recipes.

7. Awareness and orientation

Spatial

☐ The courtyard is visible from indoor public and private spaces so residents can easily receive information regarding weather, time, seasons and ongoing outdoor activities.

☐ A courtyard layout is "readable" and easily understood with clearly defined parts and distinctive landmarks.

☐ There is a circular or loop walkway that begins and ends in the same place to reduce confusion and frustration of orientation.

☐ Courtyard entries are located at a space with environmental cues (e.g., windows with view out toward gardens, indoor plants or landscape painting) to increase awareness of the outdoor space.

☐ Provide a familiar transitional space (e.g., sunroom, a porch) between indoor and outdoor areas so residents can get inspired to venture further into the courtyard.

Built

☐ Provide maps and directional signs to the courtyard.

☐ There are garden structures, furniture or sculptures (e.g., gazebo, pergola, umbrella tables or planting boxes) serving as landmarks to facilitate navigation.

☐ There is a thermometer to inform temperature or hats on the wall adjacent to the door leading to the courtyard to remind people of having protection from the weather.

Sensory

☐ There are spring and fall landscape material to enhance season awareness and cues conversation.

☐ The color contrast between walkway surface and lawn as well as surrounding pavement provides visual cues to lead people to different destinations.

☐ Background noises are reduced to prevent residents from becoming confused and disorientated when trying to identifying a variety of sounds.

8. Sense of ownership

Built

☐ A place is created for residents to display their hand-made decoration or personally meaningful mementoes.

☐ Selection of furniture is based on resident decision or preference.

☐ Plants in named containers are provided to increase sense of ownership.

Sensory

☐ There are spaces that allow residents to see results of gardening applied by residents' vernacular knowledge of gardening.

Spatial

☐ Sub-territories are created in the courtyard, allowing people to create or personalize their spot.

9. Participation of meaningful activity

Built

☐ Provide raised bed, gardening tools and supplies (e.g., plant support, shepherd hooks, fertilizers) to enhance results of resident garden work and to facilitate performing normal social roles such as a green thumb and mother.

☐ There are resident-made birdfeeders and birdhouses to attract birds and wild animals.

☐ Provide furniture and seating near activity spots (e.g., raised beds) so residents can observe and "supervise" plants or activities.

Spatial

☐ Provide walk paths that promote exercise and give some “challenge walk” for those who like to be challenged and to explore.

☐ A generous size pavilion is provided to accommodate different activities such as arts and crafts, gardening, flower arranging and music concerts.

☐ Sunny seating areas in a porch or patio are provided to allow residents to expose their body to the sun for metabolism of vitamin D.

Sensory

☐ There are seasonal decorations like Christmas trees and Christmas lights in outdoor environments for celebrating important events.

☐ Provide vegetable, herb or fruit gardens so residents have opportunities to harvest, taste and share the produce with other people.

☐ Natural material with different texture is provided in outdoor home tasks such as digging, deadheading and watering.

Appendix H: Policy and Program Information Form & Resident & Staff Information Form

Organizational Survey (Policy and Program Information Form)

Date _____

Section I: Financial and Entrance Arrangements

1. Is there an initial entrance fee? ☐ Yes ☐ No
If so, what is the minimum fee?
☐ Less than \$1,000
☐ \$1,000 to \$4,999
☐ \$5,000 to \$9,999
☐ \$10,000 or more
2. What is the minimum monthly rate for residents who are not receiving federal or state aid?
☐ Less than \$200
☐ \$200 to \$399
☐ \$400 to \$599
☐ \$600 to \$700
☐ \$800 or more

What services are covered by this monthly rate?
☐ Room
☐ Board
☐ Cleaning or maid service
☐ Personal care
☐ Nursing Care
3. Are rates set on a sliding scale based on the resident's income? ☐ Yes ☐ No
4. Must a prospective resident be ambulatory? ☐ Yes ☐ No
5. Is there a minimum age requirement? ☐ Yes ☐ No
If so, what is it? _____
6. Is there a waiting list for this facility? ☐ Yes ☐ No
If so, about how many people are on it? _____
7. How many residents can live here all together? _____
8. How many residents are living in the facility at the present time? _____

Section II: Types of rooms and features available

1. If this facility is divided into rooms or dormitories, please answer the following questions?
 - a. What is the total number of rooms for residents? _____
 - b. How many private rooms are there? _____
 - c. How many rooms are there with two residents? _____
 - d. How many rooms are there with three residents? _____
 - e. How many rooms are there with four or more residents? _____
 - f. What is the largest number of residents who share one room or dormitory unit? _____

- g. How many private bathrooms are there? _____
- h. How many bathrooms are share by two residents? _____
- i. How many bathrooms are shared by three or more residents?
- j. What is the largest number of residents who share one bathroom area? _____

2. About rooms

- a. Are there furnished rooms or apartments? ☐Yes ☐No
- b. Do residents have their own individual mailboxes? ☐Yes ☐No
- c. Is there a dresser for each person? ☐Yes ☐No
- d. Are there locks on all bathroom doors? ☐Yes ☐No

Section III: Organizational Policies

Part I: General Information

1. Which of the following best describes the ownership and management of the facility?
 - ☐ Individual or partnership
 - ☐ Nonprofit organization
 - ☐ Government or public
 - ☐ Large corporation
 - ☐ Small corporation
 - ☐ Management company
 - ☐ Other _____
2. Does this facility have a board of directors? ☐Yes ☐No
 - a. If so, how many members are on the board? _____
 - b. How often does the board meet?
 - ☐ Once a month or more
 - ☐ Quarterly or bimonthly
 - ☐ Once or twice a year or less
3. If there is a board of directors, does it have a say in any of the approaches used or the activities provided in the facility? ☐Yes ☐No
4. Do some of the staff, other than the administrator, regularly attend board meetings?
5. Is there a handbook for residents (e.g., rules, medical procedures, etc.)? ☐Yes ☐No
6. Is there a handbook for staff (e.g., policies, operating procedures, and treatment approaches)? ☐Yes ☐No
7. Does the facility have an orientation program for new residents? ☐Yes ☐No
8. Is there an orientation program for new staff? ☐Yes ☐No
9. Are there formal staff meetings? ☐Yes ☐No
 - a. If so, how often
 - ☐ Once a week or more
 - ☐ Once or twice a month
 - ☐ Less than once a month
 - ☐ Only when needed
10. Are there volunteers who help out in the facility? ☐Yes ☐No
 - a. If so, is there an orientation program for volunteers? ☐Yes ☐No

Part II: Rules related to personal possessions and behaviors

This section includes questions about the rules and expectations for residents. Check the boxes that best describe the policies and procedures in this facility. The following categories are used for PartII.

1. Encouraged —this kind of behavior or activity is encouraged here
2. Allowed —this kind of behavior is expected; no special attempt is made to change it
3. Discouraged —an attempt is made to discourage or to try to stop this behavior
4. Intolerable —a person who persisted in this type of behavior would probably have to move out

	Encouraged	Allowed	Discouraged	Intolerable
1	Drinking liquor in one's room			
2	Having one's own furniture in the room			
3	Moving furniture around the room			
4	Keeping a fish or bird in the room			
5	Keeping a hot plate or coffee maker in the room			
6	Doing some laundry in the bathroom (e.g., washing socks or underwear)			
7	Drinking a glass of wine or beer at meals			
8	Skipping breakfast to sleep late			
9	Closing the door to one's room			
10	Locking the door to one's room			

Please use the following categories to describe the facility's policies with respect to these behaviors and activities:

1. Allowed —this kind of behavior is expected; no special attempt is made to change it
2. Tolerated —this kind of behavior is expected, but an effort is made to encouraged the individual to function better or more appropriately
3. Discouraged —an attempt is made to discourage or to try to stop this behavior
4. Intolerable —a person who persisted in this type of behavior would probably have to move out

Part III: Expectations relating to level of functional ability

	Allowed	Tolerated	Discouraged	Intolerable
1	Inability to make one's own bed			
2	Inability to clean one's own room			
3	Inability to feed oneself			
4	Inability to bathe or clean oneself			
5	Inability to dress oneself			
6	Incontinence (of urine or feces)			
7	Confusion or disorientation			
8	Depression (i.e., frequent crying or sadness)			

Part IV: Rules related to potential “problem” behaviors

	Allowed	Tolerated	Discouraged	Intolerable
1	Refusing to participate in programmed activities			
2	Refusing to take prescribed medicine			
3	Taking medicine other than that which is prescribed			
4	Taking too much medicine, intentionally or otherwise			
5	Being drunk			
6	Wandering around the building or grounds at night			
7	Leaving the building during the evening without letting anyone know			
8	Refusing to bathe or clean oneself regularly			
9	Creating a disturbance; being noisy or boisterous			
10	Pilfering or stealing others’ belongings			
11	Damaging or destroying property (e.g., tearing books or magazines)			
12	Verbally threatening another resident			
13	Physically attacking another resident			
14	Physically attacking a staff member			
15	Attempting suicide			
16	Indecently exposing self			

Part V: Resident Participation

- Are any of the residents hired and paid for jobs within the facility? ☐Yes ☐No
- Do any of the residents have other types of chores or duties (unpaid) that they preform here? ☐Yes ☐No
 - If so, how many residents participate? _____
- Is there a residents’ council (i.e., residents who are elected or volunteer to represent residents at regularly scheduled meetings)? ☐Yes ☐No
 - If so, how many residents are on it? _____
 - How often does it meet?
 - ☐ Once a week or more
 - ☐ Twice a month
 - ☐ Once a month or less
- Are there regular “house meetings” for residents (a general meeting open to all residents)? ☐Yes ☐No
 - If so, how often do they occur?
 - ☐ Twice a month or more
 - ☐ Once a month
 - ☐ Less than once a month
 - ☐ Only when needed _____ ☐Yes ☐No

5. Are there resident committees (or committees that include residents as members)?
☐Yes ☐No
 a. If so, list the most important committees, the number of residents on each, and how often they meet.
6. Is there a newsletter? ☐Yes ☐No
 a. If so, how often is it printed?
☐ Once a week or more
☐ Twice a month
☐ Once a month
☐ Less than once a month
 b. If so, is it primarily written by residents? ☐Yes ☐No
7. Is there a bulletin board? ☐Yes ☐No
 a. If so, is it being used by residents? ☐Yes ☐No
 b. Are rules and regulations posted on the bulletin board or in another convenient public location? ☐Yes ☐No

Part VI: Decision Making

To what extent are residents involved in policy making in the following areas?

	Staff administration basically decide by themselves	Staff administration decide but residents have input	Residents decide but staff has input	Residents basically decide by themselves
1	Planning entertainment such as movies or parties			
2	Planning educational activities such as courses and lectures			
3	Planning welcoming or orientation activities			
4	Deciding what kinds of new activities or programs will occur			
5	Making rules about attendance at activities			
6	Planning daily or weekly menus			
7	Setting mealtimes			
8	Setting visitors' hours			
9	Deciding on the décor of public areas (e.g., pictures, plants, etc.)			
10	Dealing with safety hazards			
11	Dealing with residents' complaints			
12	Making rules about the use of alcohol			
13	Selecting new residents			
14	Moving a resident from one bed or room to another			
15	Deciding when a troublesome or sick resident will be asked to leave			
16	Changes in staff (hiring or firing)			

Part VI: Decision Making

Section I: Services

Please indicate which of the following services are provided by this facility

1. Regularly scheduled doctor's hours...☐Yes ☐No
2. Doctor on call...☐Yes ☐No
3. Regularly scheduled nurse's hours...☐Yes ☐No
4. Assistance in using prescribed medications...☐Yes ☐No
5. On-site medical clinic...☐Yes ☐No
6. Physical therapy...☐Yes ☐No
7. Occupational therapy...☐Yes ☐No
8. Psychotherapy or personal counseling...☐Yes ☐No
9. Religious advice or counseling...☐Yes ☐No
10. Legal advice or counseling...☐Yes ☐No
11. Assistance with banking or other financial matters...☐Yes ☐No
12. Assistance with housekeeping or cleaning...☐Yes ☐No
13. Assistance with preparing meals...☐Yes ☐No
14. Assistance with personal care or grooming...☐Yes ☐No
15. Barber or beauty service...☐Yes ☐No
16. Assistance with laundry or linen service...☐Yes ☐No
17. Assistance with shopping...☐Yes ☐No
18. Providing transportation (e.g., minibus or pickup car)... ☐Yes ☐No
19. Handling spending money for residents...☐Yes ☐No

Part II: Additional services and procedures

1. Is breakfast served each day?... ☐Yes ☐No ☐M-F only
 - a. What hours is breakfast served? _____
 - b. How many residents use this service on a typical day? _____
2. Is lunch served each day?... ☐Yes ☐No ☐M-F only
 - a. What hours is breakfast served? _____
 - b. How many residents use this service on a typical day? _____
3. Is dinner served each day?... ☐Yes ☐No ☐M-F only
 - c. What hours is breakfast served? _____
 - d. How many residents use this service on a typical day? _____
4. Are snacks served in the afternoon or evening?... ☐Yes ☐No
 - a. How many residents use this service on a typical day? _____
5. Can residents choose to sit wherever they want at meals?... ☐Yes ☐No
6. Does a staff member take attendance or count residents at mealtimes? ...☐Yes ☐No
7. Is there a fairly set time at which residents are awakened in the morning?... ☐Yes ☐No
 - a. If so, what time?
 - ☐ Before 7:00
 - ☐ Between 7:00 and 8:00
 - ☐ Between 8:00 and 9:00
 - ☐ 9:00 or later
8. Are there certain times during which residents are expected to take baths or showers?... ☐Yes ☐No
9. Is there a fairly set time at which residents are expected to go to bed (lights out) at night? ...☐Yes ☐No

- a. If so, what time?
- ☐ Before 8:00
- ☐ Between 8:00 and 9:00
- ☐ Between 9:00 and 10:00
- ☐ 10:00 or later
10. Is there a "curfew" (i.e., a time by which all residents must be in the facility in the evening)?
- ... ☐ Yes ☐ No
- a. If so, what time
- ☐ Before 9:00
- ☐ Between 9:00 and 10:00
- ☐ Between 10:00 and 11:00
- ☐ 11:00 or later
11. Does the staff take a count or make a check each day to be sure that none of the residents are missing?... ☐ Yes ☐ No
12. Are some areas of the building locked or out of bounds to residents at times (e.g., the dining area, the craft room, certain lounges or stairways)? ... ☐ Yes ☐ No
13. Are there regular visiting hours?... ☐ Yes ☐ No
- a. If so, what are the hours on a weekday? _____
14. Are there offices that are closed and private that can be used for interviewing residents?
- ... ☐ Yes ☐ No
15. Is background music played in the building? ... ☐ Yes ☐ No

Part III: Activities that take place in the facility

For each activity, indicate the frequency of occurrence and about how many residents participate.

	Very rarely or never	Only a few times a year	Once or twice a month	Once a week or more	About how many residents participate
1 Exercises or other physical fitness activity					
2 Outside entertainment (e.g., pianist or singer)					
3 Discussion groups					
4 Reality orientation group					
5 Self-help or mutual support group					
6 Films or movies					
7 Club, social group, or drama or singing groups					
8 Classes or lectures					
9 Bingo, cards, or other games					
10 Parties					
11 Religious services					
12 Social hour (e.g., coffee or cocktail hour)					
13 Arts and crafts					

Resident & Staff Information Form

Date: _____

How long has this facility been in operation? _____

Section I: Overall Residents' Background Characteristics

1. How many residents are living here at present? _____
2. How many of the residents are _____ Male _____ Female
3. How many of the residents are
_____ less than 55 _____ 55 to 64 _____ 65 to 74
_____ 75 to 84 _____ 85 and over
4. How many of the residents are
_____ Asian American _____ White _____ Black
_____ Hispanic _____ Other
5. How many of the residents come from the following religious backgrounds?
_____ Catholic _____ Jewish _____ Protestant
_____ Other _____ None
6. How many of the residents are
_____ married _____ separated or divorced
_____ widowed _____ single
7. How many of the residents come from the following educational backgrounds?
_____ Less than high school _____ High school _____ College
_____ Master's degree _____ Doctoral degree _____ Professional degree (MD, JD)
8. How many of the residents come from the following occupational backgrounds?
_____ Unskilled laborer
_____ Blue-collar worker
_____ Clerical or sales worker
_____ Homemaker or housewife
_____ Semiprofessional
_____ Manager or managerial worker
_____ Professional or executive
9. How many residents were not born in the United States? _____
10. How many of the residents do not speak English well enough to make themselves easily understood? _____
11. How many residents pay all or a portion of their fees with Medicare? _____, and how many residents pay all or a portion of their fees with Medicaid? _____
12. How many residents receive other forms of aid? _____
Please specify type of aid: _____
13. Indicate the number of present residents who have been living in the facility
_____ Less than 1 month _____ 7 to 12 months
_____ 1 to 6 months _____ More than 12 months
14. About what proportion of prospective residents visit the facility before actually entering? _____
15. How many residents have died in the past 3 months? _____
16. How many residents have left the facility in the past 3 months (not counting deaths)? _____
How many of these residents went to
_____ Own home or home of friends or relatives
_____ Nursing home
_____ Senior independent living
_____ Assisted living
_____ Hospital
_____ Other (please specify) _____

Section II: Overall Residents' Functional Abilities

Part I: Activities of Daily Living

How many residents:			
	Number who do this without help	Number who do this with some help	Number unable to do this
1. Take care of their own appearance			
2. Eat their meals			
3. Dress or undress themselves			
4. Walk			
5. Get in and out of bed			
6. Take a bath or shower			
7. Get to the bathroom on time			
8. Make their needs or wishes clearly understood			
9. Handle their own money (e.g., pay bills)			
10. Use the telephone			
11. Go shopping for groceries and clothes			

Part II: Resident Disability

How many residents

1. Do not see well enough to read a (normal print) book or newspaper (even with glasses)_____
2. Use a hearing aid or should use a hearing aid_____
3. Use wheelchairs_____
4. Have poor upper limb capacity_____
5. Do not know what day and year it is_____
6. MMSE score >24 points_____
- MMSE score between 20 and 24 points_____
- MMSE score between 13 and 20 points_____
- MMSE scores <12 points_____

Part III: Resident Activity

During the past week, about how many residents have actually taken part in the following activities?

1. Watched TV?_____
2. Listened to music (e.g., radio or records)?_____
3. Read a newspaper or book?_____
4. Wrote (e.g., letters, poems, etc.)?_____
5. Sewed or knitted?_____
6. Played cards, checkers, chess, or a similar game?_____
7. Played pool, bingo, or dominoes?_____
8. Drew or painted?_____
9. Engaged in photography, woodworking, ceramics or other hobby?_____
10. Took care of plants or gardened?_____
11. Went outside on a nice day?_____
12. Took a walk?_____

Do the residents leave the facility for any of the following activities? For each activity, indicate about how many people participate in it and how often

615

If so, which of the following best describes this program?

- ☐ Informal or on-the-job training only
- ☐ Training during orientation with continuing on-the-job training
- ☐ Training at regular staff meetings on a continuing basis
- ☐ Training at regularly scheduled meetings with programs of films, outside speakers, and so on.

Part II: Volunteers

These questions concern volunteers and the services they perform

1. Are there volunteers who help out in the facility? ☐ Yes ☐ No
 - a. If so, about how many different people volunteer their time in a typical week? _____
2. Please estimate the number of volunteer hours per week spent in
 - a. Activities, treatments, or other direct contact with residents _____
 - b. Other (such as administration, maintenance) _____
3. Is there a program of training for volunteers? ☐ Yes ☐ No
 - a. Which of the following best describes this program?
 - ☐ Informational or on-the-job training only
 - ☐ Orientation for new volunteers with continuing supervision and on-the-job training
 - ☐ Ongoing, regular meetings and continuing supervision
 - ☐ Regularly scheduled meetings with special programs (e.g., outside speakers or films)

Appendix I: Organizational and Staff Variables in Literature and Their Groupings

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Sensory Stimulation	Organizational philosophy & culture	Role and responsibility
	<u>Value:</u>	<u>Who are gardeners?</u>
	<ul style="list-style-type: none"> Integrating resident lives with opportunities of multiple experience 	<ul style="list-style-type: none"> Allowing both staff and residents to take care of gardens without feeling stress or burdened
	<u>Communication (inter-group relations):</u>	
	<ul style="list-style-type: none"> Cooperative departments in providing multiple sensory stimulation 	
	Outdoor policy	Education
Safe & Secure Environments	<u>Place rules:</u>	<u>Skills in utilizing garden resource</u>
	<ul style="list-style-type: none"> Defining or regulating smoking and gardening behavior 	<ul style="list-style-type: none"> Increasing knowledge of utilizing natural material in programmed activities
	Resources	
	<u>Financial support:</u>	
	<ul style="list-style-type: none"> Financial resources in providing multiple-sensory experience 	
	<u>Maintenance:</u>	
	<ul style="list-style-type: none"> Specifying and regulating roles and responsibility of taking care of outdoor and garden space. 	

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Safe & Secure Environments	Outdoor program	Decision-making
	<u>Activity setting:</u>	<u>Selection of a course of action:</u>
	<ul style="list-style-type: none"> Provision of safe and comfortable activity environments 	<ul style="list-style-type: none"> Ensuring a safe environment to encourage self-initiated or spontaneous outdoor use
	Outdoor policy	Role and responsibility
	<u>Surveillance:</u>	<u>Who are gardeners?</u>
	<ul style="list-style-type: none"> Keep space monitored by staff 	<ul style="list-style-type: none"> Defining responsibility of staff in maintain safe and secure environments (e.g., seeking expert horticultural advice regarding safe and tolerant plants)
Resources	Resources	
	<u>Staffing:</u>	
	<ul style="list-style-type: none"> Adequate staff in monitoring environments and providing assistance in access 	

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Accessible Space & Built Features	<i>Organizational philosophy & culture</i>	Role and responsibility
	<u>Value:</u>	<u>Who are gardeners?</u>
	▪ Encouraging independent use of outdoor space	▪ Defining responsibility of staff or volunteers in connecting community resource to make outdoor space more accessible
	<u>Structure:</u>	▪ Allowing resident involvement in taking care of plants
	▪ A structure to provide more accessible resource and to respond resident needs more immediately	
	<u>Communication (inter-group relations):</u>	Education
	▪ Cooperative departments in delivering accessible outdoor space and programs	<u>Skills in utilizing garden resource</u>
		▪ Increasing knowledge of providing accessible natural material
	Outdoor program	
	<u>Individualization:</u>	
	▪ Programmed outdoor activities that gives one-on-one attention and planned adaptations specified to personal needs and meanings	
	Outdoor Policy	
	<u>Free access:</u>	
	▪ Allowing independent visits of outdoor space	
	Resource	
	<u>Staffing:</u>	
	▪ Adequate staff in providing assistance in access to outdoor space and to natural material	

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Privacy	n/a	n/a

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Familiarity	Outdoor program	
	<u>Activity setting:</u>	n/a
	▪ Support of providing familiar activities for family and friend participation	

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Information	<i>Organizational philosophy & culture</i>	Role and responsibility
Awareness	<u>Structure:</u>	<u>Who are gardeners?</u>
And Spatial	▪ A flexible structure to make resource more	▪ Making residents be aware of

Orientation	noticeable and predictable in resident daily lives.	potential workload and schedule of gardening
	<i>Outdoor program</i>	<i>Education</i>
	<u>Regularity:</u> <ul style="list-style-type: none"> Ensuring activity programs with predictable schedule and regular events that are significant to resident everyday lives. <u>Surveillance:</u> <ul style="list-style-type: none"> Increasing awareness of space being monitored 	<u>Skills in utilizing garden resource</u> <ul style="list-style-type: none"> Increasing knowledge of providing verbal or visual aids in facilitating gardening activities

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Sense of Ownership	<u>Place rules:</u> <ul style="list-style-type: none"> Defining or regulating extent to which residents are allowed to garden, decorate and modify surroundings 	n/a

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
	<i>Organizational philosophy & culture</i>	<i>Selection of a course of action</i>
	<u>Value:</u> <ul style="list-style-type: none"> Quality of care from a holistic point of view <u>Communication (inter-group relations):</u> <ul style="list-style-type: none"> Cooperative departments in supporting individualized activities 	<u>Selection of a course of action:</u> <ul style="list-style-type: none"> Encouraging self-initiated or spontaneous activities that is significant to an individual
	<i>Outdoor program</i>	<i>Role and responsibility</i>
	<u>Individualization:</u> <ul style="list-style-type: none"> Programmed outdoor activities that gives one-on-one attention specified to personal needs and meanings 	<u>Who are gardeners?</u> <ul style="list-style-type: none"> Making gardening or taking care of plants be a part of resident everyday life or routine which they are familiar with
Participation in Meaningful Activity	<i>Outdoor policy</i>	<i>Education</i>
	<u>Place rules:</u> <ul style="list-style-type: none"> Defining or regulating gardening behavior 	<u>Knowledge of care for different needs</u> <ul style="list-style-type: none"> Increasing knowledge of a holistic approach to meet different needs <u>Skills in utilizing garden resource</u> <ul style="list-style-type: none"> Increasing knowledge of designing gardening as part of resident everyday lives and enhancing past sole roles
	<i>Resource</i>	
	<u>Staffing:</u> <ul style="list-style-type: none"> Adequate staff in providing assistance in access to outdoor space and to natural material 	

	ORGANIZATIONAL FACTORS	STAFF-RESIDENT RELATIONS
Social Interaction	<i>Organizational philosophy & culture</i>	<i>Role and responsibility</i>
	<u>Value:</u> <ul style="list-style-type: none"> ▪ Encouraging participation of programmed group activities 	<u>Who are gardeners?</u> <ul style="list-style-type: none"> ▪ Volunteers involvement increasing opportunities of resident social interaction with community members
	<u>Communication (inter-group relations):</u> <ul style="list-style-type: none"> ▪ Cooperative departments in encouraging participation of programmed group activities 	
	<i>Outdoor program</i>	
	<u>Individualization:</u> <ul style="list-style-type: none"> ▪ Programmed outdoor activities catering personal needs of social interaction 	
	<u>Activity setting:</u> <ul style="list-style-type: none"> ▪ Support of providing different activities for family and friend participation 	

Appendix J: Nursing Home Courtyard Audit Tool for Organization

Please rate the following statements regarding organizational attitudes toward uses of the garden on a scale from 1 (Poor) to 5 (Very successful).

- 1= Poor
- 2= Fair
- 3= Good
- 4= Very good, could be improved
- 5= Very successful

1. Privacy

-
- ☐ The courtyard satisfies a variety of privacy needs (e.g., privacy for two-person and a group gathering).
-
- ☐ Staff is trained to make supervision less of an invasion of privacy in the courtyard.
-
- ☐ Adequate resource (e.g., furniture, plant materials) allows staff to create social settings with different privacy levels in the courtyard.
-
- ☐ Furniture in the courtyard is selected to allow residents and family to arrange for a better sense of enclosure.
-

2. Social interaction

-
- ☐ One goal of this courtyard is to foster and facilitate different forms of social events from two-person gathering to a cookout.
-
- ☐ Social interactions in the courtyard highlight not only therapeutic purposes but also social roles residents play in the past such as mother, husband and gardener.
-
- ☐ The organization supports staff to try new and different social events in the courtyard.
-
- ☐ Outdoor picnic, family BBQ, friend private party and other resident-or family-initiated events are allowed in the courtyard.
-

3. Accessible Space & Built Features

-
- ☐ The courtyard allows independent and self-initiated visits.
-
- ☐ Different departments work as a team to make outdoor space and activities accessible.
-
- ☐ Organizational structure is flexible in order to provide accessible outdoor resource and to immediately respond to resident needs.
-

☐ The garden is always available, unlocked and unalarmed during days if the weather is permitting.

☐ There is available staff to deliver individualized activity in the courtyard (e.g., one-on-one gardening).

4. Sensory Stimulation

☐ One goal of this courtyard garden is to provide quality of sensory stimulation.

☐ Different departments are cooperative in facilitating provision of outdoor programs for multiple-sensory experience (visual, touch, taste etc.).

☐ There is a clear policy regulating smoking, gardening and outdoor eating.

☐ There is adequate financial resource in providing materials for multiple-sensory experience.

☐ There is assigned responsibility regarding taking care of the courtyard.

5. Safety and security

☐ The courtyard garden is checked and maintained on a regular basis to ensure a safe environment.

☐ Requests of courtyard maintenance made by residents are taken care of right away.

☐ There are opportunities (e.g., resident council or meeting) allowing residents to express the safety concerns of the courtyard.

☐ There is adequate staffing to provide assistance in access and to check outdoor residents.

☐ There is sufficient infrastructure like emergency communication device in the courtyard to allow resident to communicate with indoor staff.

6. Familiarity

☐ The courtyard garden is to facilitate familiar activities such as caring for plants or picking up vegetables.

☐ Spontaneous activities such as gardening (weeding, deadheading, and watering) and arranging furniture are encouraged. There is no need to get staff's permission.

☐ Staff is encouraged to program outdoor activities that are familiar in the locality.

☐ Adequate resources like plant materials, furniture or decoration are provided for staff to create a familiar and domestic setting.

7. Information awareness and spatial orientation

-
- ☐ The courtyard is aimed at reducing confusion related to time, seasons and place.
-
- ☐ The garden is included as a part of an introductory tour or orientation program.
-
- ☐ Information regarding open/close of the courtyard is announced to residents through different ways (e.g., newsletters, notice and flyers).
-
- ☐ Rules of using the courtyard in terms of regularity of activities and surveillance are clearly communicated to residents, their families and staff.
-
- ☐ Some strategies (maps and directional signs) are applied to increase awareness of outdoor activities and orient residents to the courtyard.
-

8. Sense of ownership

-
- ☐ One goal of the courtyard garden is to cultivate the sense of the ownership (i.e. experience of making decisions and taking responsibility for use of the courtyard).
-
- ☐ Residents are consulted in planning the courtyard and their advice is acted on.
-
- ☐ There are rules that regulate extent to which residents are allowed to garden, decorate and modify the courtyard.
-
- ☐ Residents are allowed to bring their flower pots, furniture, bird feeders from homes or have some choice in selection of plant materials or furniture.
-

9. Participation of meaningful activity

-
- ☐ The courtyard is designed to provide opportunities of performing past social roles (e.g., “green thumbs”, “handyman”) with which residents are attached.
-
- ☐ Cross-departmental collaboration support individualized outdoor activities that give one-on-one or small-group attention specified to personal needs and meanings.
-
- ☐ The organization provides adequate support in term of availability of staff, volunteers, and financial resource (e.g., wheelchair-friendly tool, accessible planters) to carry out individualized activities
-
- ☐ Policy facilitates staff to design activities adapted to residents with different cultural backgrounds.
-
- ☐ Staff has opportunities to learn new skills in making the courtyard garden more productive and rewarding.
-
- ☐ Staff, residents and family members are encouraged to share and enjoy results of their garden works together (e.g., tasting garden-grown vegetables, having garden cut-flowers in the buildings)
-

Appendix K: Nursing Home Courtyard Audit Tool for Staff-Resident

Interactions

Please rate the following statements regarding staff attitudes toward resident uses of the courtyard on a scale from 1 (Poor) to 5 (Very successful).

- 1= Poor
- 2= Fair
- 3= Good
- 4= Very good, could be improved
- 5= Very successful

1. Privacy

-
- ☐ A variety of social settings are created to meet different level of privacy needs in the courtyard.
-
- ☐ Resident's choice of outdoor privacy level (public or private seats) is inquired before bringing residents to the outside.
-
- ☐ Staff make supervision less an issue in the courtyard.
-
- ☐ Residents and family members are encouraged to rearrange furniture to create their preferred intimacy level.
-

2. Social interaction

-
- ☐ Different forms of social activities from a small group to a cookout event are provided in the courtyard.
-
- ☐ Residents who sit in the courtyard are not constantly forced to converse with staff or participate in activities.
-
- ☐ Spontaneous social activities in the courtyard are encouraged.
-
- ☐ Adequate resources in terms of space, furniture and plant material are provided to facilitate programmed social activities.
-
- ☐ The organization supports staff to learn new knowledge and try new activities in the courtyard.
-

3. Accessible Space & built Features

-
- ☐ Different activity settings (i.e., one-on-one, small (four to five participants) and large groups) are provided based on resident functional levels.
-
- ☐ Staff have adequate knowledge to make natural material more accessible (e.g. specialized tools, movable or adjustable furniture).
-
- ☐ Residents are encouraged to learn to do things on their own in the courtyard.
-
- ☐ There are adequate resources to create prosthetic environments (i.e., assistive gardening tools, ramps and gardening tables) for activities.
-

4. Sensory Stimulation

-
- ☐ Multiple-sensory stimulation is provided in outdoor structured activities.
-
- ☐ Spontaneous gardening (e.g., deadheading, watering), picking up or tasting vegetables is encouraged.
-
- ☐ Resident preference of sensory experience (e.g. color of flowers, sounds of birds) is inquired and taken into account in selection of plants, furniture or decoration.
-
- ☐ Staff have knowledge in utilizing natural resources to program activities.
-
- ☐ Both staff and residents have a role in maintaining quality of sensory stimulation provided in the courtyard.
-
- ☐ There are different resources in the courtyard (e.g., flowers, trees, water) allowing staff to provide activities related to five-sense experience.
-

5. Safety and security

-
- ☐ Outdoor activities are programmed in a good balance between safety and slight risk-taking
-
- ☐ Activity staff can easily get extra hand in transporting residents so no resident is left alone in the courtyard.
-
- ☐ The courtyard is monitored in an unobtrusive way.
-
- ☐ Staff is able to watch the courtyard from the inside while conducting a daily work routine.
-
- ☐ Staff encourages residents to talk about their concerns of using the courtyard.
-

6. Familiarity

- ☐ One goal of programmed activities in the courtyard is to ease the transition from home to nursing home.
 - ☐ There are inquiries about types of indoor or outdoor activities which residents are familiar with.
 - ☐ Staff is acquainted with the life history and individualized leisure for each and every resident.
 - ☐ Staff is supported to select plant materials, furniture or decoration that are familiar in the locality.
 - ☐ The courtyard has resources (e.g., furniture, raised beds and decoration) to accommodate activities with which residents are familiar (e.g., setting a picnic table, feeding birds, watering plants).
-

7. Awareness and orientation

- ☐ Some activities in the courtyard aim at reducing confusion related to day, seasons and place.
 - ☐ Schedules of activities in the courtyard are reminded through verbal conversation, activity calendar, and posters.
 - ☐ There is regularity of outdoor activities so residents are able to predict what may happen next if the weather is permitting.
 - ☐ Availability of the courtyard is announced by staff and open/close signs.
 - ☐ Staff members make themselves visible and reachable in the courtyard so residents know where they can find staff for assistance.
-

8. Support of ownership

- ☐ Activities are provided in the courtyard to cultivate sense of ownership (e.g. putting name tags next to flowers, placing resident-made decoration).
 - ☐ Residents are encouraged to care for flowers or vegetables, and they are consulted in caring for gardens.
 - ☐ Residents' vernacular knowledge of gardening is applied to taking care of the courtyard garden.
 - ☐ There are adequate resources to facilitate residents to do gardening or supervise the courtyard garden.
-

9. Participation of meaningful activity

☐

Activities are provided in the courtyard to allow performing a past social role such as green thumb, worker, manager or housewife.

☐

Structured gardening activities are provided to emphasize a positive and familiar feedback loop – gaining and also giving something to environments.

☐

Staff and residents work as a team to take care of gardens and enjoy the results of garden works (e.g., tasting garden-grown vegetables).

☐

Staff have knowledge in making the courtyard garden more productive and rewarding.

☐

Resident's garden related work or project is displayed, announced, credited or honored.

☐

Residents are aware of staff using garden materials in activities (e.g., cooking or art class).

☐

There is adequate resource for staff (wheelchair gardening tools, fertilizer, plant supports) to enhance results of resident's hard garden work.

Appendix L: Example of Behavior Map & Behavior Checklist

BEHAVIOR MAP

Location:	Date:	Time:
-----------	-------	-------

The floor plan is a complex layout of a facility. At the top, there are several rooms labeled 'COMPARTMENT D' and 'FE & CAB'. Below these are various other rooms, including 'AIR CHANGEL', 'AIR RESTROOM', 'AIR HALLWAY', 'AIR SOCIAL SERVICE', 'AIR ACCOUNTING', 'AIR STYL', and 'AIR TRAINING SPEECH'. There are also several circular areas and a central grid area. Three specific locations are marked with numbered circles: '1' is in a small room at the bottom center, '2' and '3' are in a circular area on the right side. A black arrow starts at location '1' and points towards the top left of the plan.

BEHAVIOR CHECKLIST

Individual or group number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
INDIVIDUAL ACTIVITY																				
Gender																				
Moving																				
Sitting																				
Standing																				
Kneeling/ Bending																				
Active Interactions w/ P.S																				
<i>Gardening</i>																				
<i>Organizing environments (raking, arranging furniture, etc.)</i>																				
<i>Making decoration</i>																				
<i>Checking plants or filling birdfeeders</i>																				
<i>Others</i>																				
Passive Interactions w/ P.S																				
<i>Using a cellphone</i>																				
<i>Reading</i>																				
<i>Writing</i>																				
<i>Listening to music</i>																				
<i>Knitting</i>																				
<i>Eating/drinking</i>																				
<i>Purposeful walking</i>																				
<i>Exercising</i>																				
<i>Playing with pets</i>																				
<i>Watching people</i>																				
<i>Others</i>																				
Disengaged behavior																				
Challenging behavior																				
GROUP ACTIVITY																				
Size of the group (# of residents)																				
# of males and females (M/F)																				
Participant Led																				
Family Led																				
Staff Led																				
Active Interactions w/ P.S																				
<i>Gardening</i>																				
<i>Organizing environments (cleaning up, arranging furniture, etc.)</i>																				
<i>Making decoration</i>																				
<i>Others</i>																				
Passive Interactions w/ P.S																				
<i>Social gathering</i>																				
<i>Reality Orientation/Reminiscence activity</i>																				
<i>Playing games</i>																				
<i>Watching a performance</i>																				
<i>Having a party (singing, picnicking, etc.)</i>																				
<i>Exercise/Physical Therapy</i>																				
<i>Others</i>																				
# of residents with Disengaged																				

Behavior																						
# of residents with Challenging Behavior																						
Notes																						

Appendix M: Narratives from Resident Interviews of Home

Garden/Gardening

Garden rules			
Following rhythms of seasons		Principles of better gardening	Family teamwork
Silver Life			
SL1— Martin	<ul style="list-style-type: none">● After the winter, the ground is kind of hard. Digging things is very difficult. You have to break it in spring time and start all over again.	<ul style="list-style-type: none">● Although my garden was facing north, my tomatoes still grew. I thought they would need a lot of sun.● I love my dog but if he went to my tomato garden, I would tell him "Don't do that". Just don't do that! He knew I didn't want him to do that.	<ul style="list-style-type: none">● Since I have stroke, my wife took care of the garden. Kids helped get rids of weeds.
SL2— Clark	<ul style="list-style-type: none">● In April, my parents cleaned up their garden and started to grow things...In the fall, they pulled corn and get ready for the next year.	<ul style="list-style-type: none">● If you let tomatoes grow slowly and let them ripen, they will taste better than store tomatoes. They are picked up when they are green.	<ul style="list-style-type: none">● My dad was a great gardener. My parents always had a large garden at the back of the house. He used to plant corn, tomatoes and lettuces for many years. My mother used to can and preserve the stuff. However, my wife and I weren't in the position to do that.
SL3— Mary		<ul style="list-style-type: none">● To have a good garden, you want to make sure that everything is watered.	<ul style="list-style-type: none">● My husband and I both decide what kinds of vegetables we grew in the garden. We went to a nursery and brought plants.● My husband would ask my preference of flowers and I would give him my advice.● I had a garden. My husband did all gardening. He created it but we both used the garden.
SL4— Ella		<ul style="list-style-type: none">● You just pull dandelions, pulling their roots.● When you see flowers turning brown, you have to do deadheading.● You can just grow gardenia with water. When they get strong , you transplant the plants to the ground. You will get many Gardenia bushes.	<ul style="list-style-type: none">● I have eight sisters and we used to help in gardens. It was a family project. My dad knew how to do it. Days of gardening were my family time.● Every summer, we got together and did gardening at home.
SL5— Wendy	<ul style="list-style-type: none">● I clean up the garden for spring around Easter.	<ul style="list-style-type: none">● Roses require a lot of care and attention.	<ul style="list-style-type: none">● My husband and I created the garden and we both enjoyed it.● My husband would help me in the garden but he was in charge of the lawn. He mowed the lawn and trimmed bushes.
SL6— Dolly	<ul style="list-style-type: none">● We used to clean up our garden in the fall and pull dead stuff so it would be ready for the spring. When the spring comes, of course, you have to clean up again.● You turn the soil in autumn and prepare for the winter when the	<ul style="list-style-type: none">● I used to pay attention to roses and put some pesticide. I had a good lunch with them.● You have to clean up the garden because you don't want to leave stuff behind; it may cause diseases. When you turn the soil, you put compost.	<ul style="list-style-type: none">● My mom had a garden and a greenhouse attached to her home. She had my dad build a greenhouse attached to their home.● My kids used to help me in the garden. That was how they learn gardening. My son is a big gardener.

	weather is permitting, otherwise it is so freezing.	<ul style="list-style-type: none"> ● You have to rotate vegetables and stuff every year. ● Make sure you have good soil! That is the number one thing. The second thing is using your space wisely. 	He just loves gardening. He should have been a farmer. Of course, I taught him how to garden.
SL7— Emma	<ul style="list-style-type: none"> ● Before the winter came, I turned the soil and turned it again in the spring. 	<ul style="list-style-type: none"> ● My garden has a lot of sun. It is good for flowers and vegetables. ● I used to have dogs. They were not allowed to play in the garden. No, No, No! ● Don't forget water and keep weeds out. 	<ul style="list-style-type: none"> ● My husband helped too but the garden was not that big so I can handle it by myself.
SL8— Aaron		<ul style="list-style-type: none"> ● I used to mow the lawn once a week, otherwise I would be ostracized by neighbors. 	<ul style="list-style-type: none"> ● I mowed the lawn and my wife did gardening. She asked me to repair things and mow the lawn and said she would take care of flowers. She died 17 years ago and nobody took care of flowers. ● When my brother and I were kids, we helped in the garden.
SL9— Isabelle	<ul style="list-style-type: none"> ● In spring, I used to go to nurseries and picked up flowers. 		<ul style="list-style-type: none"> ● My husband mowed the lawn. As we got older, we had somebody to do it...My husband and I took care of the garden together.
SL10— Beth	<ul style="list-style-type: none"> ● As soon as the frost was out of the garden in the spring, we started to get the garden ready to plant things. The time was probably in May. 	<ul style="list-style-type: none"> ● We have two long garden plots. We could grow anything we want except potatoes. If we grew potatoes, probably we would need a whole plot for them. 	<ul style="list-style-type: none"> ● My husband and I used to work together to keep weeds out. That was all we could do.
SL11— Amber			<ul style="list-style-type: none"> ● My husband was a great gardener. He was quite a green thumb. After he passed away, I couldn't take care of the garden by myself, no more. ● My husband built an enclosed porch on our patio. Everything was screened so I wouldn't get any allergy. ● My husband was the one creating the garden. I did eating...We just picked up everything we like and grew in the garden.
SL12— Cindy			<ul style="list-style-type: none"> ● My husband took care of weeds and I took care of vegetables. He mowed and turned soil too.
SL13— Adam		<ul style="list-style-type: none"> ● Trees are big and they can take care of themselves. ● You cut spinaches at the top. They grow again. ● If you don't weeds, they will kill all the plants. I did use sprays; I pulled by my hands. Sprays kill everything and they bring poison on the food you eat too. ● Tomatoes are not hard to grow but after a while, they fall over the ground. You can get a stick and fix them. 	<ul style="list-style-type: none"> ● (daughter's comment) His mom had a garden. My dad had a garden and he also took care of a garden of his mother-in-law. ● (daughter's comment) Gardening is kind of a joined thing. My dad would plow fields. Both my mom and dad would plant vegetables. My mom did a lot of watering because she stayed at home and took care of kids. She gardened and they both weeded. Kids were stuck to do weeding too although we tried not to.
SL14— Jane	<ul style="list-style-type: none"> ● I would cut some stuff down in the fall and prepare the garden for the winter. 	<ul style="list-style-type: none"> ● I had a lot of sun in the garden and coleuses should be in the shade. They are beautiful but they should be in the shade. ● Raspberry bushes need a lot of sun so we grew them at the back. There was a lot 	

	of sun.	
SL15— Ana	<ul style="list-style-type: none"> ● In the fall, I would take everything out. If I wanted to preserve their roots, I put them aside, otherwise, I would just leave them. You don't plant when the weather is still freezing. I would probably start in May around Memorial Day. That was the time that our garden started. 	<ul style="list-style-type: none"> ● I did the farming and my husband worked in a company. I would ask my husband to take out something with deep roots.
SL16— Carol	<ul style="list-style-type: none"> ● In the fall before snow coming, you pull things out and work on the ground. 	<ul style="list-style-type: none"> ● Watch the frost in the fall and take good care of your garden!
SL17— Jimmy	<ul style="list-style-type: none"> ● In the summer, the grass grew so quickly. I used to mow the lawn once a week. 	<ul style="list-style-type: none"> ● We had a lawn. Unfortunately, I had to mow the lawn. My wife created and took care of the garden. I helped her sometimes. ● I did help my wife to get rid of weeds but it was long time ago...I fixed thing and kept the house.
SL18— Tina	<ul style="list-style-type: none"> ● You have to hill potatoes. When you plant in the ground, you hill them. You cover them with the soil. Everybody knows about that. 	
SL19— Joan		
SL20— Molly	<ul style="list-style-type: none"> ● I took care of the garden. My husband made fence for the garden. 	
SL21— Tim	<ul style="list-style-type: none"> ● We had electricity in 1937. Before that, we used to have a lantern to walk around the field. We had to finish our work before it became dark because we could not see anything in the dark. It was not really dark but it was dark enough that no outside work could be done. 	<ul style="list-style-type: none"> ● We had a lot of sandy soils. Potatoes are the things that can grow so well in there. ● If you have good soil and you put fertilizer, you can have a good garden. ● There is only one cob per corn stalk that is five or six feet tall. Sometimes there are two cobs. ● (brother's comment) When we were kid in Minnesota, we had to pull weeds out. At that time, we hated everything related to the garden. ● (brother's comment) My brother and I grew a lot of rutabagas and delivered to stores. Our farm was 88 acres. That was a family project. We have 10 kids in the family. Most of the farms in 1930s were 100 to 120 acres. Now, they said an 88-acre farm is like a small city. ● (brother's comment) Older kids were like our boss. They made younger kids to pull weeds. My dad was never in the garden. He worked on machine in the shop, built fence and took care of cattle.
Golden Age		
GA1— Allie	<ul style="list-style-type: none"> ● You plow it up in the spring. You dig up again in the fall. In the spring you plow it again and start planting. Some people believe you have to mix soil with sand but it is not necessary. 	<ul style="list-style-type: none"> ● You called it crabgrass but we call it St Augustine grass; it won't die. It spreads but I never use sprays. Weeds have long legs. Some have short legs and they can't live long.
GA2— Chuck	<ul style="list-style-type: none"> ● I mowed the lawn every other week in summer time. 	<ul style="list-style-type: none"> ● My wife took care of the garden and I mowed the lawn and pulled the weeds. I had to move rocks so my wife could grow tomatoes. ● I milked cow when I was a kid. I tried to do that.

GA3— Erin	<ul style="list-style-type: none"> The frost would kill all vegetables, we would hang up onions. Peanuts would need to be put away. 	<ul style="list-style-type: none"> People said carrots are good for your eyes. Garlic might lower cholesterol levels. There is a joke saying an apple a day keep a doctor away and garlic will keep everyone away. Besides sweet corn, there is Indian corn. It is kind of brownish red. I don't know much about it. If you eat too many apricots, you will have diarrhea. If you just eat a few, then you will be fine. 	<ul style="list-style-type: none"> My father, brother and I used to milk the cow. We would milk them with both hands.
GA4— Fox	<ul style="list-style-type: none"> Spring is a good time to start the garden. I planned the garden in winter time. 	<ul style="list-style-type: none"> You have to cultivate flowers and dig a hole for them to grow. You have to water plants every day. Some plants need a lot of sunshine. 	<ul style="list-style-type: none"> My mom decided types of flowers that grew in the garden every year. My mom and I took care of flowers. I mowed the lawn.
GA5— Flora	<ul style="list-style-type: none"> In the fall, when all things are harvested and used in jam, cook and canning, you start cleaning up the land. 	<ul style="list-style-type: none"> You don't need to water plants every day. It depends on the rain. You can use a sprinkle if it is too dry. 	<ul style="list-style-type: none"> My mom used to do a lot of gardening. The garden was so small. It was a part of home. I helped her and did weeding. My father also did a lot of weeding and everything. My father used a tractor to clean up gardens. My mom used to decide types of vegetables we grew in the garden. She brought packages of seeds and I would go out and plant them. We covered woods around.
GA6— Gale	<ul style="list-style-type: none"> You have to clean up the gardens all year around. In the fall, you may want to take some leaves and mix with your soil. That will fertilize plants for another year. You enrich the soil. You make leaves part of nutrient. You keep doing this all the time. Snow melts in spring and summer so the garden gets some water. I like flowers. They remind me of seasons. There is something for every season. There are some colors for every season. There is beauty for every season. 	<ul style="list-style-type: none"> My dogs and cats were not encouraged to play in the garden. I chose plants depending on the size of my garden, and also the shade and sun. You want to mix plants. Some are in the sun and others are in the shade. I used to rotate the garden because of the soil. You certainly don't want everything back to take all nutrients. 	
GA7— Gina			
GA8— Jak			
GA9— Judy	<ul style="list-style-type: none"> They cleaned the garden in the fall and spring. 	<ul style="list-style-type: none"> The long lasting flowers are carnations. If you cut the stem in a diagonal, they will last longer. Carnation is one of long living flowers. They are beautiful. It is so easy to make a bouquet out of Black-eyed Susan. They are really wild flowers. It is easy to take care of them. It is also easy to take care of daisies. Once you plant them, they grow by themselves. 	<ul style="list-style-type: none"> I helped the garden when I was a young girl. My grand grandmother took care of the garden. My nana did some gardening but not a lot. It was hard to decide which vegetables we should grow so each of us pick up three of them.

	<ul style="list-style-type: none"> • We used to rotate plants in the garden so the garden wasn't always the same. They rotated the crops. 		
GA10— Kyle			
GA11— Leon	<ul style="list-style-type: none"> • In the fall, we used to pull out plants. 		<ul style="list-style-type: none"> • My mom did most of the work of picking up wild asparagus. My sister and I just helped her.
GA12— Maya	<ul style="list-style-type: none"> • You dig out roots in fall before snow comes. I cleaned the garden in spring again. 	<ul style="list-style-type: none"> • I used to have a dog but he was not allowed to play in my garden. I kept him the other part of the yard. 	<ul style="list-style-type: none"> • My kids used to help me in the garden sometime.
GA13— Portia		<ul style="list-style-type: none"> • You don't need to water every day. It depends on the soil and how things grow. If your soil has clay, mix the clay with topsoil. 	
GA14— Paul		<ul style="list-style-type: none"> • I mowed the lawn about every two weeks in summer. 	
GA15— Ross	<ul style="list-style-type: none"> • In September, you cover soils. After winter, snow melts. You start to dig holes. 	<ul style="list-style-type: none"> • You have to watch the weather and you have to know what you put in. You have to clean up the garden before winter. 	<ul style="list-style-type: none"> • I used to clean the yard myself. Other people may help water.
<i>Elderly Living</i>			
EL1— Aggie	<ul style="list-style-type: none"> • I cleaned up the garden in spring so I could plan again. 	<ul style="list-style-type: none"> • Chives just need some sunshine. 	<ul style="list-style-type: none"> • My parents used to have a garden. I helped her all the time when I was a kid. I also helped milk cows. • My mom and dad decided types of plants we grew.
EL2— Carla	<ul style="list-style-type: none"> • In October, I cleaned up the garden. In the spring, I did that again and flipped over soils. • We mowed the lawn every week in summer time. 	<ul style="list-style-type: none"> • My dog was not allowed play in the garden. 	<ul style="list-style-type: none"> • My husband helped me get rids of weeds. We took turn to mow lawns.
EL3— Jenna		<ul style="list-style-type: none"> • When coleuses produce foliage, they are pretty low and remain in green or fusion colors. I used to work for a doctor in the city. I got several coleuses over the windows; they had colored leaves. 	<ul style="list-style-type: none"> • I would help my mother to take care of the garden. • I used to help my mother in the garden because only two of us managed that big garden. When I grew up, I had one younger brother and sister. They helped in gardens until later. I didn't appreciate gardening at that time. I was doing all things because I was asked to do.
EL4— Levi			
EL5— Lana	<ul style="list-style-type: none"> • I used to pull out flowers in the fall and mix some fertilizer, Miracle, with soil. 	<ul style="list-style-type: none"> • We grew rhubarbs but we didn't take too much care of them. They grew by themselves. You pick up their stems and they grew again in the next spring. • You need to have good soils to grow things. If you have too much clay in soil, you can mix topsoil with it. You can also use some weed killers to get rid of weeds. • When dandelions have seeds and fussy stuff, it is the worse time of the garden. 	<ul style="list-style-type: none"> • My wife created the garden. She was the commander, and I was the follower. Both of us would use the garden. My wife would get rids of weeds and I would water the garden. • My wife was the one deciding types of plants in the garden. We went to nurseries and picked up whatever we like.
EL6— Paula	<ul style="list-style-type: none"> • I used to plant my marigolds on Memorial Day every year...I started to plant tomatoes on Memorial Day. • You can pick up tomatoes in your 	<ul style="list-style-type: none"> • My friend told me that if you grow a black walnut tree, flowers that under or near it will not grow well. I think it was true in my garden. I thought that was 	<ul style="list-style-type: none"> • My mother and I both use the garden...My dad would mow the lawn.

	<p>garden until they are ripe in August. Nothing can beat the taste of fresh tomatoes.</p> <ul style="list-style-type: none"> ● I usually cleaned up my garden at the end of September or beginning of October. Some flowers last longer. I pulled out their roots. I did that again in spring and put fertilizer. 	<p>interesting. I had one black walnut tree. We didn't plant it. It had been there since we moved in.</p> <ul style="list-style-type: none"> ● You should move plants like tomatoes to different spot each year because they need nutrition. A friend of mine had wonderful tomatoes. After a few years, she didn't get many tomatoes because she always planted them at the same place. You are supposed to move them to different areas. ● You have to make sure the soil has not much clay. Plants don't do well in clay. 	
EL7— Sally	<ul style="list-style-type: none"> ● In the fall, my mom cleaned up the garden. In spring she planted most of the flowers and vegetables. 	<ul style="list-style-type: none"> ● They decided types of plants they grew by the soil. It depends on what kinds of soil you have. They would pick up seeds and also pick plants from nurseries. 	<ul style="list-style-type: none"> ● My mom usually did gardening for most of the time. She was the one creating the garden and taking care of it. My dad did some. My sister helped out. ● Gardening was a collective work. It is like a family team work.

Shared & compromised gardens

	Family first	Sharing food & information	A compliant place
Silver Life			
SL1— Martin	● I used to cut the roses and give to my wife. I would also put flowers at the dining room table.	● When my grandson came to my house, I always shared tomatoes with him.	
SL2— Clark	● My parents grew vegetables that we liked. If they grew cabbages, nobody would eat cabbages. I like yellow beans and my dad used to grow those in their garden. ● My mom canned everything just for the family. She didn't share those with neighbors.		
SL3— Mary	● Tomatoes I canned were just used in the family.		
SL4— Ella		● I grew vegetables. If the school wanted some, they could have some. I also had banana trees. When they grew too many bananas, I would take some to the school...School teachers would teach me how to garden.	
SL5— Wendy	● I liked to make the property look nice for me and the family.	● I had a neighbor, who followed the same thing (growing flowers) I did. ● My neighbors asked me questions, and I also asked them what they put in their garden sometimes. We kind of exchange information. I had good friendships with my neighbors.	
SL6— Dolly		● I canned tomatoes and gave some to my neighbors.	
SL7— Emma	● I like sliced tomatoes. I also canned tomatoes for the family.		● In the evening time after supper and some chores, I started working on my garden. I spend about one hour.
SL8— Aaron			
SL9— Isabell e			
SL10— Beth	● Did I give the food to the neighbors? No, my kids ate them. I have five kids. We had lots of vegetables because we all liked vegetables. I feed my kids with the vegetables I grew. ● I didn't have too much flower space but I have more vegetable space, which is more important. I had to feed my kids and don't need to buy anything. I had two freezers; one for meat and one for vegetables.	● I didn't grow zucchinis. My neighbor did and gave some to me. When they got too much, I got some too. They taste good.	● My kids didn't like garlic. I put a little bit garlic in cook. It was not enough to get their attention.
SL11— Amber		● We always shared everything with neighbors.	
SL12—	● All vegetables were used in the		

Cindy	family. There was not enough to share with neighbors.		
SL13— Adam	<ul style="list-style-type: none"> • (daughter's comment) We didn't share with neighbors all the time. It depended on how good the crops were. If they were good, we would give some to neighbors, otherwise we just ate in the family. • (daughter's comment) They grew what we liked. They always grew a lot of tomatoes and my mom canned tomatoes and made spaghetti for the family. • You put all edible things together. You can save a lot of money for the family. • (daughter's comment) My dad grew up during depression so they raised a lot of their own food. When he had family, he still raised his own food to save a lot of money. 	<ul style="list-style-type: none"> • (daughter's comment) If it was a good year and we had so many vegetables or food, my parents would share with neighbors and relatives. Some of neighbors would grow this and that so they exchanged food; you gave me a couple of these, and I gave you a couple of those. They had more senses of community back at that time. 	<ul style="list-style-type: none"> • We didn't put our cats in the garden. There was a farmer near our house. He put poison to kill mice so we kept our cats indoors. Now the law is against that.
SL14— Jane		<ul style="list-style-type: none"> • I used to take tomatoes I grew to my church. People could just come to the church and take whatever they want. • My daughter has some flowers. She brings me some every spring. • I had a neighbor, who took courses of horticulture and worked for a florist. She helped me out. For example, she knew a lot of things about coleuses. • My niece has a lot of cherry tomatoes. She brought me two bags of cherry tomatoes. Some were red and some were yellow. I just ate them like crazy last summer. 	<ul style="list-style-type: none"> • Some of my flower grew into grass. My son cut grass and he didn't care. He just said, "mom, I cut the grass." They were on my way. I can't help it.
SL15— Ana	<ul style="list-style-type: none"> • No, I didn't grow parsnips; kids didn't like it. • My kids didn't care about peas and my husband didn't care either. If I wanted some, I went to stores to buy some. I grew something my family likes. I won't force them to eat something if they didn't like it. • We had 88 acres but the layout disallowed me to plant a lot of corn. I planted just some corn, enough for our table. • I canned a lot of beets. They all liked beets. • Having gardens was the only way to have food we want. 	<ul style="list-style-type: none"> • There were 72 cottages by our farm. If I had more things than I needed, I offered to them. A lot people who lived there for vacation didn't bother though. They just brought vegetables in stores. • We drank dandelion wine when somebody gave to us for Christmas. 	<ul style="list-style-type: none"> • My kids didn't care about peas and my husband didn't care either. If I wanted some, I went to stores to buy some. I grew something my family likes. I won't force them to eat something if they didn't like it.
SL16— Carol		<ul style="list-style-type: none"> • I shared extra vegetables with them, and they shared with me. 	
SL17— Jimmy		<ul style="list-style-type: none"> • We shared things with our neighbors. • Our friends gave us something to plant but you had to give them something in return. 	
SL18—		<ul style="list-style-type: none"> • We didn't share tomato bushes with my 	

Tina	neighbors. They stole them.
SL19— Joan	● I have four sons. That was why I did cooking and gardening.
SL20— Molly	● I like gardening. I had a two acre garden so I had some food for my five kids.
SL21— Tim	<ul style="list-style-type: none"> ● When you have 10 kids, you have to have everything. ● When we cooked, we had some garbage like corn husk. We put a five gallon can in the house and we just threw everything in the can. It went to the barns. We gave to the pig and to the yard. That was how you got rid of garbage. We buried things that animals cannot eat.

Golden Age

GA1— Allie	<ul style="list-style-type: none"> ● When my daughter was in first grade, she had a bake sell in school. I didn't have time to bake anything. I just brought some jars of pickles of green tomatoes. Little tiny tomatoes were left over from the greenhouse. They were sold out, like hot cakes, and they ask for more. I said, "I don't have anymore". After that, I tried to sell the pickled tomatoes in a store one day.
GA2— Chuck	<ul style="list-style-type: none"> ● I didn't like squash. My wife didn't plant that. ● My wife shared stuff with my neighbors. My neighbors would give me something back. My neighbor canned things too. They gave me some canned stuff. Kids sometime stole my apples. I ran after them. ● Peppers are hot. I didn't care for hot peppers. I gave to my neighbors. ● I didn't like beans. They make you a lot of gas. They put in chili. I didn't like it. I like straight chili.
GA3— Erin	<ul style="list-style-type: none"> ● We would give some milk to neighbors and we would have some for home. ● My mom would give neighbors vegetables. We used to put fertilizer for the greens like turnips so they grew very high.
GA4— Fox	<ul style="list-style-type: none"> ● My mom would give flowers to neighbors.
GA5— Flora	<ul style="list-style-type: none"> ● We didn't share things with neighbors. Food was just for my family.
GA6— Gale	<ul style="list-style-type: none"> ● We used to share things with neighbors.
GA7— Gina	
GA8— Jak	
GA9— Judy	<ul style="list-style-type: none"> ● I used to make a bouquet and give to my neighbor, an old lady. She was sweet. She passed away long time ago. ● I had some gladioluses. They made a nice bouquet. I would put on my dining

table or I would use that as a present to my friend.

- We always had too much corn in my grandfather's farm. We shared with our neighbors. He was very generous; he loved his neighbors. We exchanged the food whenever we could. He is very kind.

GA10— Kyle	
GA11— Leon	● My neighbor, I think, shared some tomatoes with us.
GA12— Maya	● I had four kids. We ate most of plums and vegetables.
GA13— Portia	● I shared vegetables with friends.
GA14— Paul	● I would share things with my friends.
GA15— Ross	

Elderly Living

EL1— Aggie	● The milk was used only used in the family.	● If we had extra, we would always share with neighbors. Our neighbor was a quarter mile away. We were alone with the woods.	
EL2— Carla		● I shared tomatoes with my neighbors.	
EL3— Jenna	● I loved success of being able to harvest something and cook for my family. I feel very proud of myself. I think that is why gardening is so interesting. We have chagnes in see how nature takes over.	● We always shared and our neighbors shared with me in return. I used to live in an apartment before I come here. There were several nouns. They had several fresh vegetables and they brought their vegetables to me couple of times.	● There was never enough time. I used to spend at least an hour a day and several days a week. I would garden in the morning or evening depending on children's schedule
EL4— Levi			
EL5— Lana		● We got petunia from my mom's house. ● We used to share vegetables with neighbors. We exchanged food.	
EL6— Paula	● The vegetables were mainly used in our family. ● My mom grew and cook things that my father would eat.		
EL7— Sally		● We used to give neighbors some vegetables, and they also gave us stuff.	

Food bank

Food bank

Silver Life

SL1—Martin

SL2—Clark

- My mom grew carrots and peas. We grew carrots in barrels and we just dug them out when we needed.
- I recalled years ago when my mom picked up some green tomatoes, she used to wrap them with newspaper and let them ripen. That was how she did it. Maybe they ripen faster.
- If you have a garden and you are good at it, that garden can sustain yourself. That can save you money. Instead of buying things from stores, you just go to your basement or get things out of your garden. It cuts down your expense if you have a good garden. My parents had a good garden and that saved a lot of money.

SL3—Mary

- We grew tomatoes, peppers, cucumbers, carrots, lettuces, zucchini, beans, peas and beats.

SL4—Ella

- We also grew gingers. We ate ginger roots and put in our cooking.

SL5—Wendy

SL6—Dolly

- I grew cucumbers, tomatoes, radishes, beans, different kinds of beans, red and green peppers. I had parsley all the time. I had spinach and lettuces.
- I ruined my shoulder because I fell into tomato bushes. I had six big tomato plants and they had tomatoes more than everybody needs.
- I used to grow different herbs like basil, chives, rosemary and thyme...I had a peach tree that produced more peaches than you can image.

SL7—Emma

- I just liked fresh vegetables so I had a garden at home. I mainly grew tomatoes, and some lettuces. Lettuces and tomatoes are my favorite food.

SL8—Aaron

- My dad had two acres of land. We planted a lot of stuff for food like potatoes, lettuces, tomatoes.

SL9—Isabelle

SL10—Beth

- I grew a lot of vegetables because I canned a lot of stuff like carrots, tomatoes, onions and corn. We didn't have quite much space for potatoes. We had lots of tomatoes. We loved tomatoes.
- We planted more vegetables because we could eat vegetables but we couldn't eat flowers. I grew some chives and dals for pickles.
- I didn't have too much flower space but I have more vegetable space, which is more important. I had to feed my kids and don't need to buy anything. I had two freezers; one for meat and one for vegetables.

SL11—Amber

- First thing my husband grew was radishes. They started to come out. We had lettuces and carrots too.
- We always had some raspberry bushes when we live in Wisconsin. When we lived in Texas, he started a new garden and went to a nursery to buy some raspberry bushes. Then people in Texas really laughed at him and my husband said, "when the first raspberry starts coming out, I eat in front of you". Surely, we did get some raspberries.
- When we lived in Wisconsin, my husband planted tomato bushes. We had a lot of tomatoes...We had an apple tree at our backyard. It was for eating. I made apple pies and apple sauce.

SL12—Cindy

- I grew vegetables so we didn't need to go to a grocery store. I had carrots and green onions. I also grew green peppers and pink tomatoes.

SL13—Adam

- I grew vegetables in my garden. It was like a ranch-style garden. I had corn, spinach, carrots, radishes, peas, and beans. I also had cherry trees, apple trees, peach trees and plum trees. I cooked them.
- I grew tomatoes, more than a dozen. I grew yellow and red peppers and hot peppers too...You got to have cucumbers and dills for pickles. We also had leaf lettuces.

SL14—Jane

- I had a very small area. I grew some raspberry bushes. They were so delicious. I also had some carrots. I planted few radishes. I love these.
- I only have few tomatoes. My garden was small...I tried to grow cucumbers. I love them. I like one person use to make pickles.

SL15—Ana

- I grew lettuces and used them in salads. I also have cucumbers on the ground; they spread all over the place.
- I had different kinds of peppers. Whatever comes out, I cooked them...I had six tomato bushes and beans.

SL16—Carol

- I had sweet corn and potatoes in my yard. I had three tomato bushes at most...I had green, red and

	yellow peppers.
SL17—Jimmy	<ul style="list-style-type: none"> ● I had a garden at the back of the house with some vegetables and flowers...We had beet, potatoes, beans, tomatoes, peppers, cucumbers, carrots, squash and zucchinis. ● We had an apple tree to make apple pies.
SL18—Tina	<ul style="list-style-type: none"> ● I had a big garden. We had garlic, cucumbers and squash. We had radishes and lettuces...We grew peppers with three different colors. We grew peas and beans. We also had corn, onion, potatoes, pole beans and regular bush beans...We had 10 to 12 tomato bushes.
SL19—Joan	<ul style="list-style-type: none"> ● I had more vegetables than flowers...we used to grow cucumbers. We had a lot of tomatoes.
SL20—Molly	<ul style="list-style-type: none"> ● We had a lot of radishes, bush beans...tomatoes...and two peach trees.
SL21—Tim	<ul style="list-style-type: none"> ● I had a lot of sweet corn, peas, beans, beets, horseradish, peppers and radishes. We had a lot of potatoes. We had cucumbers but no pumpkins. ● We had some lettuces. We grew turnips but I never ate them. We had a lot of rutabaga...Tomatoes were big deal in our farm...We had some green onions. ● We had raspberry bushes. Something very popular in that area was blueberries. We went into the woods, and we had to lower knees and pick them up. Blue berries grew in the wild on their won. We had strawberries in our garden. ● Cherries grew along the road or in the field. Some grew in the wild field. Hazelnut grew in wild land too. You have to take a nutcracker to break the shell and you nuts in the inside. ● We put milk in a five-gallon can. It was just raw milk, right out of cows. A farmer would come and pick up the can and take it to a place in the town where they made butter, butter cheese, butter milk and regular milk. ● We went deer hunting. That was one of our sources of meat. ● We had pigs, chicken, dogs and cows. We had cows so we had to milk and make hay for the winter. ● We used to go from our barn to milk house. We had to make milk. We used to feed sour milk to horses. ● I used to like watching the cattle going down in a line to the barn. When I called them, they would come in.

Golden Age

GA1—Allie	<ul style="list-style-type: none"> ● Sometimes, I had potatoes in my garden. I didn't plant them. I threw out the peels from the kitchen to the garden and the potato peels had eyes and they grew. I also had four kinds of melons in my garden. It was from the seeds I threw out. I had honeydew, muskmelon, and watermelon. My kitchen is pretty near to the garden. ● I had tomatoes, squash, pumpkins, beans and peas. I had everything... I had cilantro in my garden. Cilantro is spicy. I love cilantro...I had thousands of onions, purple, while and yellow. I had Okra plants. They were 16 feet tall. They were so delicious. ● I used to have rhubarb. A man just got it and he gave me some so I planted it behind my garage...I used to have some chives. Those were fun. ● I used to live in New Berlin and my neighbors had plum trees, sugar plum. My mom used to can them. ● If I had too many vegetables, I kept cooking them or maybe can them. Maybe someday we would eat them. Maybe we would eat them in the winter.
GA2—Chuck	
GA3—Erin	<ul style="list-style-type: none"> ● We planted tomatoes, green beans, lettuces, cucumbers and everything. We also had yellow and white corn in the field. We had farm-grown corn. ● We had squash, potatoes and peppers. Peppers are expensive. We would grow them in the garden...We had red and white onions. ● We had sorghum. Other people had Louisiana sugar cane but we had sorghums. They grew so tall, very high...We had Macintosh apple tree and my neighbors had yellow apples. We also had red and yellow plum trees. ● We had sweet potatoes and pumpkins. They grew on top of the ground. They had yellow meat...We had peanuts. We had peanut patches.
GA4—Fox	
GA5—Flora	<ul style="list-style-type: none"> ● We had beans, spinach, a lot of tomatoes and potatoes. We had a lot of lettuces, carrots, and radishes. ● My father used to plant beans and cut them and send to the factory to can...We had chives and a lot of apple trees and cherry trees.
GA6—Gale	<ul style="list-style-type: none"> ● My father used to grow potatoes. They were the major part. He had sweet corn and a lot of tomatoes...He had beans. They were just hung there and went down. ● We had some apple trees and one peach tree.

GA7—Gina	
GA8—Jak	● I just had potatoes.
GA9—Judy	● My grandfather had tons potatoes, peas, carrots, cucumbers zucchinis, squash, tomatoes and parsnips.
GA10—Kyle	● We used to have a lot of carrots and tomatoes.
GA11—Leon	<ul style="list-style-type: none"> ● We had some rhubarbs. ● My neighbor has a big garden. He had tomatoes. ● My mom, sister and I use to go to a village to pick up asparagus. They just grew in grass or long the highway.
GA12—Maya	● I had six tomatoes and cucumbers...I had couples of onions. I had bush beans too...I used to have some carrots once in a while...I had plum trees.
GA13—Portia	● I had tomatoes, squash and cucumbers.
GA14—Paul	
GA15—Ross	● I had tomatoes, radishes, beans, cucumbers and garlic...We had cherry bushes and peach trees.
<i>Elderly Living</i>	
EL1—Aggie	<ul style="list-style-type: none"> ● We used to grow strawberries and raspberries. We had wild strawberries too but we raised them. ● We had a big russet potato patch, tomatoes, pole beans and bush beans, carrots and peppers...Sometime we had sweet potatoes...We grew pumpkins with our sweet corn. ● We had green peppers, and they turn red and yellow...We had lettuces all the time...My mother plant leaf lettuces once in a while. They were just leaves no heads. ● We grew chives at the back of the house.
EL2—Carla	● I used to grow radishes, green peppers, carrots, tomatoes, small potatoes and cucumbers.
EL3—Jenna	<ul style="list-style-type: none"> ● My mother had a lot of vegetables in the garden...We also had cherry trees, tomatoes, cucumbers and radishes. I had six tomato plants when I live in an apartment. ● I had beans not peas although I remember picking up peas out of my mother's victory garden.
EL4—Levi	<ul style="list-style-type: none"> ● We grew some tomatoes, potatoes, cucumbers and carrots. ● My uncle used to have one-acre land. He grew potatoes.
EL5—Lana	● We used to grow tomatoes, raspberry bushes, plum trees, pear trees and rhubarbs.
EL6—Paula	<ul style="list-style-type: none"> ● It was good that you can have something to eat from the garden. ● I liked tomatoes. I had some tomato bushes...We had onions, radishes, carrots, lettuces, tomatoes, corn, beans and cucumbers. ● I grew some herbs at the back of my house like chives.
EL7—Sally	● My parents used to grow lettuces, carrots, tomatoes, green peppers, radishes, cherry tomatoes, cucumbers and rhubarbs.

Sensory experience

	Beautifying the house	Interactions with pets or wild animals	Cooking from the garden
Silver Life			
SL1— Martin	<ul style="list-style-type: none"> ● I grew roses. They are my favorite flowers. I like anything red. I am a red guy. 	<ul style="list-style-type: none"> ● Once in a while, I saw dear in my garden. I chased them away because they ate whatever they saw. ● One night I got home, there were a bunch of squirrels on the patio. I threw something and they all ran away. 	<ul style="list-style-type: none"> ● I grew 10 tomatoes. I liked tomatoes. I used to eat tomatoes with just saults, pepper and olive oil. Its taste was very good, nice and fresh. ● My wife put tomatoes in salads. She put some cheese, olive oil and basil. One of my daughters loves that too. ● The biggest surprise of my garden was big tomatoes. Their taste was fresher than in-store tomatoes.
SL2— Clark			<ul style="list-style-type: none"> ● My mom would use our tomatoes in salads and stew. That was very good. She was a great cook. She did a lot of canning like pickles.
SL3— Mary	<ul style="list-style-type: none"> ● We had petunias, marigolds, gladioluses and yellow tulips. They were so beautiful. ● I used to cut the flowers and put in the kitchen. 		<ul style="list-style-type: none"> ● The tomatoes we grew taste so good, very fresh. ● I had tomatoes, and I canned them. I got jars for tomatoes and put them in the basement so we had chili in winter. ● I sliced zucchinis and cooked them with butter. You can also make zucchini cakes or bread.
SL4— Ella	<ul style="list-style-type: none"> ● I like flowers. We grew gardenias along the drive way to the road. We had a lot of gardenias and they flowered all the time, all year long. I miss that. ● We had a lot of ginger lilies. They had flowers, yellow and white. ● I used to cut the flowers and make bouquets. I put flowers all over the house. 	<ul style="list-style-type: none"> ● When I lived in an apartment (the first floor), I used to sit in my chair and see humming birds and robins at my birdfeeder. 	<ul style="list-style-type: none"> ● I did grow enough tomatoes to can them. It was so wonderful to go to the garden and pick up tomatoes and cucumbers for salads right away. ● I like carrots. Once I had two bags of carrots. ● We cooked squash with chicken. You have to cook it very slowly.
SL5— Wendy	<ul style="list-style-type: none"> ● We put two rose bushes at the front of the house, one at each side of the front door. We had gladioluses too. I loved Black-eyed Susan. I grew asters at the border. We usually had white lilies and different kinds of tulips. ● I had a brother, who are into photography. He did a wonderful work. In fact, there is one picture of butterflies he took in my room. He is a quite good photographer. Yes, he took some pictures of my garden. Those were beautiful. 	<ul style="list-style-type: none"> ● I found squirrel and chipmunks playing in my garden. ● We always had dogs. They played in our backyard. 	
SL6— Dolly	<ul style="list-style-type: none"> ● I had flowers growing at the front and the back. I grew all of these flowers (the flower pictures I shown to her). They were so pretty. I had all 		<ul style="list-style-type: none"> ● I absolutely put these vegetables I grew in salads. We used to sauté zucchinis with onion or we baked it. You can make bread out of it...I pickled beets too. A lot of people do that.

	<p>different colors of tulips.</p> <ul style="list-style-type: none"> ● I love roses. I had a lot of roses. I like daylilies too. They were easy to care. I had all kinds of marigolds. ● I have a complete album of my garden and a small album of it. Unfortunately, I don't know where they are now. ● I used to cut flowers, especially roses and make bouquets and put in the dining room. 	<ul style="list-style-type: none"> ● I also canned tomatoes and gave to my neighbors. I canned peaches and froze them. I made peach pies. I think I am a good cook. ● I just picked whatever grew in my garden every year. I was pretty much all-vegetable person.
SL7— Emma	<ul style="list-style-type: none"> ● I had red petunias...I used to flowers inside the house. 	<ul style="list-style-type: none"> ● I liked sliced tomatoes. I used to canned tomatoes for the family. Tomatoes in stores have sat there for a while. They are not as fresh as those you grow by yourself. ● I grew flowers because I like to smell it and I grew vegetables because I like fresh vegetables.
SL8— Aaron		<ul style="list-style-type: none"> ● It was very nice to have fresh food from my dad's farm. ● My mother was so into preserving food. Oh, gosh! She was good at it. She was a good cook, wife and mother.
SL9— Isabelle	<ul style="list-style-type: none"> ● When I stayed in our summer cottage, we liked to walk in some of country roads. We picked up some of country flowers and made in bouquets. 	
SL10— Beth	<ul style="list-style-type: none"> ● I had 350 gladiolus bulbs in my garden. I dug them out every fall and planted them in the spring. I had all colors. I had every color and 350 bulbs of gladioluses. 	<ul style="list-style-type: none"> ● Radish! Oh! You can't pass that. You just wash them and eat them. You can slice them. You can put them in salad and that is good. Definitely, onion! You can't cook without onion. You slice onion on a hamburger. I used onion in any place. ● I always had beans in the garden. I sometime used beans in casserole...Definitely, we grew lettuces. Those are not the same with what you buy in the store. Iceberg lettuces were very good. We loved vegetables and I liked that in my salads. ● I loved tomatoes and I canned them. I made everything in juice. We drank it. I used it for soup or anything.
SL11— Amber	<ul style="list-style-type: none"> ● We have a couple of tulips at sides of our home in Wisconsin. We had some shade in the garden so we grew tiger lilies. 	<ul style="list-style-type: none"> ● I saw deer in my garden and a couple of skunks too. When beautiful deer was coming to my backyard. That was a moment to watch. I saw them in the morning and sometimes late at night. We didn't mind if they eat our vegetables. We also had quails. ● I like these little bunnies. They were surprises of my garden.
		<ul style="list-style-type: none"> ● I sliced turnips and put some butter in the pan and just browned them. ● I used lettuces in my salads. You make sweet- sour dressing with vinegar, water and sugar. ● Squash is for baking. You peel them and cut them off. You put them in a pan with brown sugar and little bit butter. You bake it. ● There was a farm near our house. The farmer grew sweet corn. My husband just brought sweet corn from him to have big

			<p>corn roast.</p> <ul style="list-style-type: none"> ● I washed peaches and peeled them. I put them in containers with sugar. You put them for a while until they turn brown. ● Mints are good with carrots, just a little bit touch of mints.
SL12— Cindy			<ul style="list-style-type: none"> ● I put green onions in my salad and sandwiches...I like radishes, long and white radish. ● I used to can peas. You don't forget onion; it gives flavor. ● Wash turnips peel them and eat them raw. Oh! They were delicious...I love tomatoes. I ate fresh tomatoes. My tomatoes were so delicious. The home-grown tomatoes were much fresher. ● I tried Dandelion wine but I didn't like it.
SL13— Adam	<ul style="list-style-type: none"> ● My mom grew some flowers along the edges. 	<ul style="list-style-type: none"> ● You put fence out there but bunnies jumped. They did. Every once in a while, you saw one but not that often. ● (daughter's comment) I can't forget the spider corner. 	<ul style="list-style-type: none"> ● The peaches I grew were delicious. ● We canned tomatoes. We canned everything that was from the garden if we didn't eat it. We had berry trees and we made jams and jelly...Tomatoes is my favorite food. ● When you peel hot peppers or slice them, they burn your finger. No matter what you do, it still burns. It gets deeper in your skin... (daughter's comment) My dad loves hot peppers. ● (daughter's comment) My mother either cooked things up for meals or she canned it or make into jam and jellies. She did whatever she could to help family go through winter. ● (daughter comment) Eating food grown by ourselves was just part of everyday life in the past. I like corn best. The flavor was just so different from in-store corn. The flavor was stronger and unforgettable. Home-grown tomatoes were bigger and juicier. ● I made some rhubarb wine. It was very good.
SL14— Jane	<ul style="list-style-type: none"> ● I have a garden at the back of the house and flower planted along the sides. There were some tulips with a variety of colors. Daily lilies and daffodils were along the house...I had different lilies in my yard. I had a lot of them by the neighbor. ● I had verbenas when I lived in a condo. I had a small patio and kept verbenas over there. ● Another home that I used to have marigolds. They had white flowers and in the fall, they turned into lavender colors. 		<ul style="list-style-type: none"> ● I put radishes in sandwiches, definitely...I tried to grow chives because I like chopped chives in scrambled eggs. You should try. I think you will like it. You can find some frozen chives. I used to spread some on my scrambled eggs. That was wonderful but for some reason, you cannot find those anymore in grocery stores. ● I always had big, nice and fresh tomatoes...I didn't have peas but when I lived with my aunt. She grew peas. She cooked peas and threw in a big plate. She took pods out and I was just eating the peas. I don't know how she cooked them. They were very sweet. ● You just washed the baby cucumber and ate them. You don't need to peel them. If I

	<ul style="list-style-type: none"> ● I had lilac bushes and I would bring them in the house. One time, one man asked me how I made these flowers growing. I said, "I don't know. I just plant them." ● Having a garden beatifies your house. My garden attracted people coming along the street. 	<p>got a bigger cucumber, I peeled them.</p> <ul style="list-style-type: none"> ● I like romaine. I can just eat them with pieces of celery. Iceberg lettuces are my favorite. No flavor is in there. It is just so crunchy and has a lot of water. Romaine has more vitamin than icebergs.
SL15— Ana		<ul style="list-style-type: none"> ● I used to cut spinach and can them. If I couldn't cook them, I would can them...I canned anything that could be put in jars...I froze peppers and put them in our salads. I froze beans. I could use them whenever I need them. ● I cooked turnips and carrots. I cooked them and we ate them on the table as vegetables. For carrots, I froze them so I could have that in winter for carrot soup. ● I cut turnip's head and tail off and wash them. I cut that in half and I cooked them and threw them in jars for winter. We used cucumbers in salads. If I had small one, I would fix them with pickles; small cucumbers are for pickles. ● I used tomato all the time for everything. I used tomatoes in soup. I put them around the roast with onions. That was good. I feel hungry now! I canned tomatoes in fruit jars. ..Tomatoes I grew were much better than those in stores. Mine got more flavors. ● We ate a lot of onions...We ate radishes as desert. You cut the top and root off and dig some sault and eat it...You can also eat green onions and dip the sault and eat. ● I canned a lot of beets. They all liked beets...If grapes grew in the garden, we used that for wine or made jelly.
SL16— Carol	<ul style="list-style-type: none"> ● I had lawns in my garden and flowers along the lawn. I have roses, tulips, zinnias, petunias, tiger lilies, asters, begonias, pansies, daisies, sunflowers and daffodils. I also love irises. ● I like flowers and I painted them (showing painting she made). I drew roses. ● I used to cut flowers and put in the living room. 	<ul style="list-style-type: none"> ● We grew up in the farm. We had some cows. ● Squirrels like nuts. I feed them. ● You slice beets and cook them with onions. I cut radishes and dipped the salt and just eat it...I cooked everything with onions. ● You can put potatoes on a griddle and fry them with some oil and just keep mixing it. That taste very good. ● I like beans in my Chinese food. I love Chinese food. That will be very good If you can cook peppers with Chinese food... ● You can take tomatoes and slice them and give them some flour and fried them. Fried green tomatoes! You would like it. It is never too late to try it. ● My mother canned tomatoes and made pickles. You can also slice them with sour cream. ● I used to mix spinach with bacon grease and sweet sour...We cooked Dandelion. My

SL17— Jimmy			grandmother cooked them. She just fried Dandelion leaves with bacon grease.
SL18— Tina	● I had roses and stuff growing in my garden.		<ul style="list-style-type: none"> ● My wife pickled beets and cucumbers. She was a good cook...She also canned tomatoes and carrots. She made apply jam and baked apple pies. ● You put radishes in salads. You make sure they are washed and clean and you cut the top and roots off and you eat them. ● My mom used to bake green peppers. She put meat inside and baked them. That was delicious. ● I used to can beets. My mom used to cook leave of beats like how you cook spinach. Medium-size beets are more tasted. I canned beans for winter time. We had to because we had nothing else to eat. ● We had corn and we used to make popcorn too.
SL19— Joan	<ul style="list-style-type: none"> ● I enjoyed yellow flowers like daisies. Flowers are so nice. ● I used to put flowers in the dining room. 		<ul style="list-style-type: none"> ● I used to pickle many things. ● I like onions. There are all kinds of different onions.
SL20— Molly	● I had tulips and daffodils	● I used to have dogs and cats. They played in the garden.	<ul style="list-style-type: none"> ● We put radishes in salads. We put lettuces in sandwiches. ● I like peas. I used to can peas. Corn is my favorite. I love carrots. ● I canned tomatoes. ● When we had special parties, we had zucchinis. I made pumpkins pies for Halloween. I make apple pies and peach pies but not anymore.
SL21— Tim			<ul style="list-style-type: none"> ● My mom used to make a lot of pea soup. She was a very good cook. ● (brother's comment) I don't like pumpkin pies. I don't like it but it is not my top choice. I don't like squash. My sister loves to make squash; I ate them just for social purpose. ● (brother's comment) When I was young, my mom canned a lot of tomatoes. ● I love beans directly out of the garden. We pickled a lot of them. You take the stem off and you peel them down like that. You press the pod and the whole thing open up. You put that in your mouth and then they all go down to your mouth. Eating raw vegetables was the best things of having a garden. ● (brother's comment) My mom canned beets and pickled them. You put vinegar and some sugar in jars. Leaves of beets would feed pigs and chickens. We also canned peas. ● I don't like the taste of pepper. They burn your tongue. The green one is really hot. Yellow or red peppers are really good. ● Rutabagas were grown on the ground.

We took them from the ground and peeled them. You slice it and you put salt on it . We ate raw rutabagas. They taste like candies...(brother's comment) When you live in a farm, you develop a taste for raw stuff. We used to eat raw cucumbers, tomatoes, radishes, carrots, kohlrabies, rutabagas and horseradish.

Golden Age

GA1—
Allie

- Do you know who like eat dandelions? Rabbits! I had a pet rabbit once. I bought them from a pet store. He was a friend of mine. The rabbit became bigger and bigger because he ate so many dandelions and he had 25 pounds. Horrible! I finally gave it away.
- I had deer in my garden because I used to live by the river, and deer live by the river. Sometimes they came in and I was in the garden, they were looking at me. I said, "oh! Hi".
- Cardinals sing prettier than robins. I don't think robins sing that much but you know what, lots of them nest every year in the front of my front porch. Their eggs were bluish. It was so pretty. Do you know the mourning dove? I don't like them. They eat robin's eggs and they lay in the robin's nest. One time, when I came back, I saw mourning doves in the driveway picking robins and trying to hurt her or killing her.
- There was a small cat that I used to watch when I worked in my garden. I called her Mama because she had kitten ever year. She had kids about three times a year. She was somebody's cat but they moved away and they just left her. She has black yellow spot. She just hanged around and liked watching me in the garden.

- I cut tomatoes in pieces and boil. I had peas too. Peas are fun. You cook them in same way with beans.
- I had onions and I ate it raw...We used to make radish sandwiches when we lived at home. I just cut the radishes and sliced them and put in bread. Then you call it a sandwich.
- Collards are delicious. You cook in the same way that you cook spinach. Just put in the pot with water and cook and all is done. You can stir with whatever you like.
- I love red and yellow peppers. They are sweet...I love garlic. I put garlic in everything. I used to can them...I used to can okras and carrots and make pickles.
- I picked up rhubarb in the garden and made pies. It was very tasty. Delicioso! I put a lot of sugar in there. Delicioso!
- Chives make a good taste of everything.

GA2—
Chuck

- My wife likes flowers and she planted flowers. She had roses.

- We had deer, rabbits and squirrels. That is ok. I ate all these. I went deer hunting in winter time. They were very tasty. I didn't have too many birds.
- I had dogs and cats. They played in the yard but they died.

- We had an apple tree and oak tree...My mom made apple pies and jam. She was a good cook. She could cook anything. She also canned everything like peaches.
- I had tomatoes at the back of the house. My wife planted tomatoes...She canned tomatoes. I canned stuff too...she cooked tomatoes in a pot, cut them off, and put in a jar.
- My wife put peppers with everything. She canned peppers and peas too. Those peppers were hot. I don't care for hot peppers. I gave to my neighbors. My wife also canned peaches.
- She made pumpkin pies; they were like sweet potato pies.
- My wife just knows how to garden. She knows everything. She also knows how to

		cook from the garden. She is a better cook than any person I knew.	
GA3— Erin		<ul style="list-style-type: none"> ● We had apples trees. Do you know Blue Jays? We called Jay birds; They would peck apples and my brother would pick up rocks and shoot them. ● In Thanksgiving, all men went deer hunting. Deer had tags on ears. The call venison. It was very tasty. Deer would go to corn fields; rabbits would eat all vegetables. The squirrels would eat nuts, all kinds of nuts. ● We also ate rabbits before. My mom would boil them and fry them. That was very good. ● We had a big old shepherd. He used to play in the farm. He was very smart. He liked to play with my brother. 	<ul style="list-style-type: none"> ● I like yellow corn. Its taste is much better. We would cut it twice and put seasonings and put in an oven. They were so delicious. ● My mom made home-made biscuits and gravy. We would eat them with milk. ● We would bake yellow squash. We would make coffee cake out of zucchinis. I really enjoyed that. It was fun. ● My mom canned tomatoes and I did that too. We had green tomatoes. We grinded them and made Cha Cha out of it. We had fried green tomatoes. In winter time, we made soup out of tomatoes and we put different kinds of vegetables. We made salads too. That was fun. ● We would peel out red potatoes and boil them and mesh them up. We also made potato salads. We would cut onions and bell peppers into small pieces and made salads. We had pickles too. ● We used to stuff peppers sometimes with hamburger and meat...We would put carrots in our biscuit soup. We would cut lettuces into small pieces and cut onions and make salads. ● We loved to drink sorghum juice or molasses. ● My mom used to can peaches. We put water and sugar and canned them. We would make apple sauce. We had yellow and red plum and we made jam out of them. We made apple pies and put ice cream on apple pies. ● We had some hot peppers like Jalapeno. They were really hot. I didn't like it.
GA4— Fox	<ul style="list-style-type: none"> ● I had many flowers: pansies, red roses, petunias, red tulips, carnations, red hibiscus, snapdragon and marigolds. I like red flowers. 	<ul style="list-style-type: none"> ● I found squirrels in my garden. Rabbits may eat flowers. I used to feed peanuts to squirrels. They were not afraid of me. ● No raccoon. Nobody keeps them in houses. 	
GA5— Flora	<ul style="list-style-type: none"> ● I like flower gardens. I used to grow tulips, petunias, daisies. My mom used to have zinnias, roses, Black-eyed Susan, marigolds, pansies, and a lot of flowers. 	<ul style="list-style-type: none"> ● My father would shoot deer so we could have some meat. ● We had a lot of squirrels and rabbits. ● My father used to have cats and dogs. They were out of the garden. 	<ul style="list-style-type: none"> ● We boiled spinach and put some salt; we would eat like that. ● We used to can tomatoes and make tomato jam. ● Lettuces are good food. They are for sandwiches and everything. You can also put mayonnaise on that. ● We just ate raw radishes. You peel and slice beets and add some salt and peppers. ● We used to make apple and cherry pies. Sometime we had bananas and my mom would make banana pies...We used to make apple jam. ● My mom used to have several recipes; she canned things or made jam out of things from the garden. That was good.

GA6—
Gale

- My dad used to go mushroom hunting. Mushrooms were cooked with butter. You could also put in pancakes.
- My mom used to make some apple pies and peach pies as dessert.
- We ate tomatoes in either sandwiches or salads.
- My mom could cook anything she got from the garden. She was very active in that way.

GA7—
Gina

GA8—
Jak

GA9—
Judy

- I had a house close to a library. I had a garden with all flowers...I had a white house with background and shade.
- I had roses. They were pale pink.
- In front of the house on the left, we had Azaleas. I remember they were orange. We also had daffodils; they blossomed in early spring.
- We had few petunias, pale purple. We also had white and dark-purple lilacs.
- We had tiger lilies. I remember morning glories. Those were grown by my grandparents.
- I had some gladioluses. They made a nice bouquet. I would put on my dining table or I would use that as a present to my friend.

- My brother used to have a dog, a German shepherd. He was in a farm but was shot. My brother sent him to a vet but he still lost one leg. Anyway, he was a part of our family. We had a white cat. When we were kids, we dressed the cat with dog's clothes and ran away. That was funny

- We also had white and dark-purple lilacs. They had a very strong fragrance... My grandmother used to cook them and put milk in them. I didn't like their taste.
- My nana used to make the best pumpkin pies. They said sweet potatoes are almost the same with the pumpkins...My nana used to pickle radishes with some tomatoes. I never had that recipe. It was very tasty. It is good with hot dogs.
- We canned corn and had pickles...I like horse radishes. It is spicy. I don't think we have those here. I used to buy from a farmer's market.
- I used to make stuffed green pepper. I usually put meat and rice in green pepper... Red potatoes taste better.
- I ate fresh beets with vinegar.

GA10—
Kyle

- My wife made preservation of food.
- We loved Macintosh apples. If you want to make some cooking, you want to take some Macintosh apples. My wife made apple jam and I made apple pies. She liked to make jams. My wife is an excellent cook.
- I liked chopped radishes. The more you chop the better they taste.

GA11—
Leon

- We just had some plants in the front and back of the house.

- My friend used to raise rabbits. I saw squirrels at home but never saw deer. My neighbors had brown rabbits. He had over 10 or 20 rabbits. He raised them in cages.

- My mother used to make rhubarb pies...My mom was a good cook and so was my sister. I was spoiled. They also made a lot of German dessert once a year.
- One of my favorite vegetables is asparagus.

GA12—
Maya

- I had daylilies, couple of rose bushes, begonia, tiger lilies, Black-eyed Susan, daisies, gladiolus, asters, and pansies. I did have tulips. I had red, purple and couples

- I used to put my meats and soups with onions.
- I used to can tomatoes. If there were a lot of them at the time, you could only eat so many raw tomatoes. You just cook them up and put them in a jar and put these jars in

of yellows.

the basement. We had a small room in the basement.

- I like lettuces but I didn't grow it. I like sweet-sour purple cabbage...If I made radishes sandwiches, I would slice them, and otherwise, I would just bite the fresh radishes.

GA13— Portia	<ul style="list-style-type: none"> ● I found rabbits in my garden. We had deer too. We had squirrels. ● A lot of birds were in my garden. 	<ul style="list-style-type: none"> ● I used to make dandelion wine. It tastes good if you make it right. I put sugar in there. ● I love fresh vegetables. That was why I had my garden. ● My neighbor was a farmer. He used to make some stuff and sell it. I used to buy it from him. The taste was so good. His cucumber was the best.
GA14— Paul		<ul style="list-style-type: none"> ● I used to like my mom's steam potatoes. He did some home-made bread.
GA15— Ross	<ul style="list-style-type: none"> ● I had a lot of tulips, pansies and begonias. The beauty of the garden was my motivation of doing garden. ● I had some rabbits in my garden. 	<ul style="list-style-type: none"> ● We used to can beans. ● I put a lot of garlic in my meat...I used to cook using the vegetables growing in the green.

Elderly Living

EL1— Aggie	<ul style="list-style-type: none"> ● We had tulips, petunias, pansies, daisies and phloxes. 	<ul style="list-style-type: none"> ● I put bulbs of tulips and squirrels dug them out. ● We used to have three cows at a time. I helped milk the cows...we had chickens and a dozen of pigs too. We raised pigs for our own meat. I had a brother. He had goats; he used to milk goats. 	<ul style="list-style-type: none"> ● The taste of cultivated and wild strawberries is different but they both are good. If you have enough wild strawberries, you will like them but they don't exist anymore. ● We put sweet potatoes around roasted ham. We cooked them and ate sweet potatoes like that. They were good. ● We made pickles. We always had cucumbers to eat...You can make zucchini cakes...We used to can peppers. ● Sometime I sliced radishes into dishes and put a little salt on them and I just ate them. ● We even ate dandelions, their leaves in the spring before they become too big. You make wine out of flowers. My grandmother made wine out of them. The wine tastes good. I never made it. ● I pickled most of the beets. My family liked them pickled. I also canned them. I put sugar and vinegar and cooked them. After a while, I put in a jar and closed the can. You cook them first and peel. ● We used to can tomatoes and also put some in a freezer. We would use them later in the year. ● To cook red beets, don't cut the top all the way off. Leave about half inch so you can keep colors of red beets, otherwise, they bleed and lose their colors. ● You can stuff chicken in peppers and bake in the oven. ● I like onion. I used to cook everything with onions. Here, we don't have any onion. I don't know why.
---------------	--	---	---

EL2— Carla	<ul style="list-style-type: none"> ● I grew flowers along the border, some carnations, daisies, marigolds and daffodils. Daffodils give me supervises. ● My dad had roses. 	<ul style="list-style-type: none"> ● We used green peppers and radishes in salads. ● I put some basils on the top of pasta.
EL3— Jenna	<ul style="list-style-type: none"> ● We used to grow a lot of flowers. The flower garden used to sit aside of the house. We had interesting types of flowers like bleeding heart flowers. They had pink flowers. ● We had daffodils, roses, lilies. I had alyssums along the border. I didn't have begonias but my friend, she did. We had crocuses. They are the first flowers in the spring. ● I made flower bouquets sometimes in our big house in Brookfield. We had several Lilac bushes. We had white and purple. They were so beautiful in the house. They smell so good. 	<ul style="list-style-type: none"> ● I don't remember we had a lot of birds; I guess because we had cats. We had a couple of cats. They played outside. They played both inside and outside. ● There was a large magnolia tree in my garden. They smell so good. Just after blossom, they fell off and I had to clean up all the flowers on the ground. ● I just eat raw radishes. I washed it and cut it off and eat. I didn't dip any salad dressing but you can. ● We set up stuff and shaved them and we ate the raw peas right out of the garden. You took peas out of pods. ● I like regular tomatoes more than cherry tomatoes... I love onions. I put everything with onions. I like to put onion with hamburger with tomatoes. I love Spanish. You can put in salad or cooked salad. ● I like garlic. A friend of mine who marry an Italian guy told her how to use garlic in their meals. She invited me for a lunch. I came home and my husband said, "where have you been?" Garlicks go into you blood. Their smell radiates out from your whole body. ● I like chives with cottage cheese. I didn't grow any herbs. We did have mints. We would put mints in ice tea. We had apple tree and pear trees but we didn't care of it.
EL4— Levi	<ul style="list-style-type: none"> ● We always had flowers like snapdragons and asters... I love beauty of flowers. 	<ul style="list-style-type: none"> ● My husband used to can and pickle things. He was good at that. He had nine children in his family so he had to help take care of his family. His mom died in 58...he was pretty good at cooking. ● I like stuffed peppers.
EL5— Lana	<ul style="list-style-type: none"> ● We had a lot of zinnias, lilac bushes, peonies, hydrangea, marigolds, impatiens, geraniums, roses, tulips and petunias. 	<ul style="list-style-type: none"> ● I had a cat. He used to watch me when I was gardening. We had a birdbath at the back and bird feeder hanging outside the kitchen window. ● My neighbor had a lot of chipmunks. ● Grass snakes were the biggest surprise of my garden. I picked them up and put in the garbage. ● My neighbor had a dog. He liked to poop in our garden. My wife was so mad at him. ● My mom would can tomatoes. We would cut the tomatoes and put in a freezer so we can use in winter time. You can make soup too. ● My wife was a very good cook. Her mom was a good cook and so is my daughter. ● My neighbor used to pick up Dandelion leaves and make salads before I sprayed. He also made Dandelion wine. It tasted good. ● We grew rhubarbs and my wife would make rhubarbs pies.
EL6— Paula	<ul style="list-style-type: none"> ● I used to have tulips, lilies, hollyhocks, pink and red roses, marigolds, coleuses, pansies and begonias. 	<ul style="list-style-type: none"> ● We just sliced and ate fresh radishes. ● I used to cook everything with garlic. I also grew some chives and it was very handy. If I need chives in my cook, I just went to the garden and pick up some chives. It was so easy. ● There is no comparison! Fresh tomatoes grew in my garden were so fresh. In winter time, you go to a grocery store and see

fresh tomatoes from California. However, these tomatoes were picked up so early. Their flavors aren't as good. They are not sweet. You can pick up tomatoes in your garden until they are ripe in August. Nothing can beat the taste of fresh tomatoes.

- My mom used to can tomatoes...I didn't can tomatoes but I would put in zipper bags and place them in my refrig so I could use them in winter time. I have a wonderful tomato soup recipe. My daughter followed the same recipe last year and she liked it.

- You can replace lettuces with dandelion leaves in sandwiches or salads.

EL7—
Sally

- We used to have hibiscuses, asters, tiger lilies, irises, begonias, crocuses, pansies, tulips and roses

- I saw bunnies, squirrels and raccoons.

- My mom used to can tomatoes and her mother did that too. They used to freeze a lot of stuff too like tomatoes and rhubarbs.

- My grandma had a space at her basement. She put pickles and beets and everything. They used to can beets and a lot of things. They were so good.

- Home-grown vegetables are different from store vegetables. There is always a plus --to save some money.

A nature lab

Gardening as trial and error		Unpredictable gardens
Silver Life		
SL1— Martin		
SL2— Clark	● Sometimes crops came out more than you can handle. When we had a lot of tomatoes, my mom canned, stewed, and preserved them. We used to have a basement. She put peas, carrots and whatever she had.	
SL3— Mary	● My husband learned about gardening by himself. He had a couple of gardening books and he tried.	
SL4—Ella		
SL5— Wendy	● I learned by mistakes. I tried several times to learn about gardening. ● When flowers didn't grow well, I felt disappointed. I tried to think where I did wrong.	
SL6— Dolly	● My mother leaned how to garden by herself. She taught me how to garden by examples. ● One time I did grow garlic. It was little hard to grow. After that, I just went to a market to buy it.	
SL7— Emma	● When things didn't go so well, I could try next year.	
SL8— Aaron		
SL9— Isabelle		
SL10— Beth	● We learned from trying different things. You learn from what you are doing. Nobody taught us how to garden.	
SL11— Amber	● When my husband started planning the garden, people laughed at him saying that nothing can grow from this type of ground. What he did was buying some fertilizer and mixing with soil. It worked! ● He liked to try new things but not very often.	
SL12— Cindy		
SL13— Adam		
SL14— Jane	● When I brought my first house, I didn't know anything about gardening. I found a mix of flowers in my yard and I planted them. My neighbor knew a lot of gardening; she looked over my fence, and said, "What are you doing?" I said, "I am weeding". She said, "Do you realize you are leaving the weeds growing and you are getting rid of your flowers. " That was how bad I was. I won't admit it at that time. After years, I started to admit it. ● Sometime you planted the wrong thing but you just kept trying.	● Sometime you thought you were planting something but it turns out to be another plant. Sometime, you didn't expect they can grow to such height.
SL15— Ana	● I just thought this flower was pretty here so I grew. If they work, next year I will plant them more.	● I brought four little pigs about this big. When they got bigger enough, I had them breed. One night, they gave birth and I had 57 baby pigs. It was January and the weather was cold so I piled the straws and put light.
SL16— Carol		
SL17— Jimmy		

SL18—

Tina

SL19—

Joan

SL20—

Molly

SL21—

Tim

Golden Age

GA1—

Allie

- I used to grow corn every year and I quit. It took too much space.
- I learned things by myself.

- Sometimes, I had potatoes in my garden. I didn't plant them. I threw out the peel from the kitchen to the garden and the potato peel had eyes and they grew. I also had four kinds of melons in my garden. It was from the seeds I threw out. I had honeydew, muskmelon, and watermelon. My kitchen was pretty near to the garden.
- We had a tomato plant that was 14 feet high. Imaging how many tomatoes you can pick up!
- I got mints growing all over. I didn't plant mints though. They grew by themselves. I sometime made mint teas.
- One year, I had so many carrots and we even left the rest of them in the garden.

GA2—

Chuck

GA3—

Erin

GA4—

Fox

GA5—

Flora

GA6—

Gale

- My dad learned which plant would grow in our garden.

- You may get surprises any time from the garden. You just keep your eyes open for anything that comes out from the garden.
- If things grow so well, you want to thank Mother nature because you are not doing by yourself. There is a lot of involvement; it is not just your effort. You cannot control everything.

GA7—

Gina

GA8—

Jak

GA9—

Judy

GA10—

Kyle

- It was hard to grow squash. We tried it.

GA11—

Leon

GA12—

Maya

- Nobody taught me. I just tried it and did it. If it worked, I just kept doing in that way. To me, gardening was just so basic.

- You will be surprised how tasty they are. They are so much better than those you buy from stores.

GA13—

Portia

- I learned by mistakes. I learned by myself. Nobody taught me anything.

GA14—

Paul

GA15—

Ross

- Gardening is a trial and error thing. That is your decision of what you like to see something from a previous year or something from the new year. If you don't like it, you take it out.

Elderly Living

EL1— Aggie		
EL2— Carla	● I taught myself how to garden. I just tried it.	
EL3— Jenna		● Sometimes something did not materialize as we expect.
EL4— Levi		
EL5— Lana	● You learn things by trying things.	
EL6— Paula	● My friend didn't have a big garden. She once grew tomato plants hanging upside down. Those were good.	● I got big tomatoes from my garden one year. The tomatoes were so big. Yes, beefsteak! They were so good and I was so surprised they got so big. We just grew them at sides of the house, not even in the garden. I am glad you remember the name, "beefsteak". I should write that down because I would never remember the name.
EL7— Sally		

Competing with nature

	Battling with the uninvited	Weather factors
Silver Life		
SL1— Martin	<ul style="list-style-type: none"> ● There were a couple of times that some animals ate my tomatoes so I put fence around the tomatoes. 	
SL2— Clark	<ul style="list-style-type: none"> ● We had dogs. Maybe that was the reason that we didn't have rabbits or other animals eating vegetables. I don't recall we have troubles with squirrels. 	
SL3— Mary	<ul style="list-style-type: none"> ● I think my husband used some chemicals to kill bugs. 	
SL4—Ella		
SL5— Wendy	<ul style="list-style-type: none"> ● We used chemicals to kill weeds but only in a very little amount. By and large, I think dandelions are pretty. Sometime I drove along the street and found an open field filled with yellow dandelions was very beautiful. ● Weeding and trimming were difficult sometime. ● Another issue was disturbance of mosquitos. I sat at the yard and they bit me. 	
SL6— Dolly	<ul style="list-style-type: none"> ● I pulled weeds by my hands. If they were hard to kill, I would spray them. Pulling weeds sometimes made no difference because their roots were so long. Sometimes I had to put weed killers. ● I had an enclosed yard so I didn't have to compete with wild animals. 	<ul style="list-style-type: none"> ● There is not much you can do when the weather is too hot or too cold. You can cover plants if it is too cold. If it is too hot, there is not much you can do except watering.
SL7— Emma	<ul style="list-style-type: none"> ● I pulled weeds. Sometime I used sprays on some areas, not all over the garden... I had some bugs but not many. ● I put fence around plants. That might stop some animals eating my vegetables. 	<ul style="list-style-type: none"> ● You don't have much control over the weather but you can always try next year.
SL8— Aaron		
SL9— Isabelle		
SL10— Beth	<ul style="list-style-type: none"> ● We always had some luck on vegetables except the dogs got in and ate carrots. They dug them up and chewed them. My dog liked carrots. I could have an odd dog. I used to have a cat. They liked lying under the bushes and eating peas. ● I cut weeds, sprayed and pulled them. Sometime I did the spray and stopped them from getting too big...You keep pulling them out until you don't see them. ● We had rabbits. They didn't seem to make troubles in my gardens. Most of them ate the lettuces but they never created too many troubles. We watched very closed. Maybe it was the dog so we didn't see many of them. 	
SL11— Amber	<ul style="list-style-type: none"> ● Bunnies always came to eat lettuces so we built fence around the garden. It stood there for a while, but after that my husband took it off. ● We had some problems of weeds. My husband put some rocks and plastics. He covered grass by sand and put plastics on the sand. He then placed rocks on the plastics and then the grass died after few days. There was no need to pull out weeds. ● We had a lot of ladybugs, millions of them. They 	<ul style="list-style-type: none"> ● My husband would take buckets of water and water plants if the weather was too dry or too hot.

	used to appear in certain time and after that, they were gone.	
SL12— Cindy	● I didn't like dandelions. My husband took care of those. He used sprays.	
SL13— Adam	<ul style="list-style-type: none"> ● I built fence to keep bunnies out. ● I pulled a bunch of weeds. If you don't, they grow so quickly. ● (daughter's comment) They didn't care if wild animals ate their vegetables. Unlike our neighbor who shot everything ran into his farm, my dad just didn't care. They felt these animals came to the land before us. 	<ul style="list-style-type: none"> ● (daughter's comment) If the weather was too hot, they would keep watering. Other than that, there was not much they could do about it.
SL14— Jane	● I picked up weeds and I didn't use sprays.	<ul style="list-style-type: none"> ● If the weather was too hot and the garden needed water, I would try to sprinkle. The sprinkle was not as good as the rain coming down but it was better than nothing. ● When I lived in a condo, I needed to water three times a day. We had to pay attention and get out to do that.
SL15— Ana	<ul style="list-style-type: none"> ● I just dug out dandelions. To clean them up, you have to get out all the roots! ● My son went deer hunting. After 18 years old, they can have permit to hunt. My son got a nice big deer first time he went hunting. We never went after squirrels and rabbits. We didn't bother them. Rabbits went to my garden and cleaned everything. I didn't care because you don't have better guys like them to clean things out. They are pretty but that's it. I didn't have fence... It was pretty open. 	
SL16— Carol	<ul style="list-style-type: none"> ● I pulled dandelions by my hands. ● I didn't sit outside of my house. There were a lot of mosquitos. ● Rabbits and deer would eat my vegetables. I saw them sometimes in the morning. 	
SL17— Jimmy	<ul style="list-style-type: none"> ● I pulled weeds or used some sprays. ● Some animals like deer and rabbits eat vegetables. They used to have a very good breakfast in my garden. 	<ul style="list-style-type: none"> ● We just kept watering if it is too hot.
SL18— Tina	● We had to put high fence because we had a terrible neighbor. He stole everything.	
SL19— Joan		
SL20— Molly	● We found a lot of rabbits in my garden. They ate my vegetables. I didn't care.	
SL21— Tim	<ul style="list-style-type: none"> ● When you have weeds in the garden, you have to figure out what are good and bad plants. You have to be very careful to pull things out. They have the same color. Sometime, you pull out vegetables by accident. ● We had dogs so animals didn't come too often. We always had dogs in the farm. ● We had to deal with poison snakes. We ran away. You better ran away from them. 	
Golden Age		
GA1— Allie	<ul style="list-style-type: none"> ● I pulled weeds out. When I was little, I used to make a bouquet of dandelions and also poison ivy. I am not allergy to poison ivy. Somebody is allergic to it. I used to make a bouquet of it. ● I felt mad at weeds. They kept coming back. I got them a damn. 	
GA2— Chuck	● I pulled weeds by hands but they would come back.	

GA3— Erin	<ul style="list-style-type: none"> ● We used to cut weeds for horses. ● We put fence and also put traps to stop animals. 	● If the weather is too dry, you need some irrigation system.
GA4— Fox	● We sprayed the weeds and pulled them by using a fork.	
GA5— Flora	● Weeds or grass were cut by machine. They would grow to this tall and they had to be cut to the bottom. We had cattle with fence around them. Cattle were allowed to come in and eat them.	
GA6— Gale	<ul style="list-style-type: none"> ● Dandelions are a real problem because they keep coming back. You have to dig out their roots. It is really hard to get rid of them. They always come back. You can certainly dig them out. You just keep weeding again. You can spray. 	● If the weather is too bad, you have to think about how you balance it or how you reduce the loss.
GA7— Gina		
GA8— Jak		
GA9— Judy	<ul style="list-style-type: none"> ● Our elm trees had some disease, called death elm disease. Some of these trees had to be taken down. ● I remember that I used to rake leaves. Oh god! What a mess! Sometime my nana used sprayed. 	
GA10— Kyle		
GA11— Leon	● I used to pull weeds for my home. I pull dandelions and cut grass. To get rid of them, you just mowed them. We had a tool and we dug down and pulled their roots.	
GA12— Maya	<ul style="list-style-type: none"> ● Some people stole my tomatoes. I had to watch out for these persons. ● I dug weeds. I didn't use spray because it would kill something you like. 	
GA13— Portia	<ul style="list-style-type: none"> ● I pulled weeds by hands. I use sprays too. I pulled weeds most of time. ● We had a dog. He used to chase animals. Dogs always chase rabbits. ● I felt frustrated when weeds came back again. 	
GA14— Paul	● I pulled dandelions by hands. You pull them out and they come back.	● We had to water the grass if the weather was too hot.
GA15— Ross	<ul style="list-style-type: none"> ● Dandelions are a killer. You have to take them out. I got very upset if they came back. ● I put fence around the garden so animals didn't eat my garden. ● Bugs were hard to deal with. 	

Elderly Living

EL1— Aggie	<ul style="list-style-type: none"> ● I dug weeds. They had a lot of seeds. My neighbor cut the grass but he didn't cut the root so we got a lot of dandelion seeds from him. We never used sprays. We had a lot of crabgrass in our garden. 	● You do the best when the weather is hot; you water and take care of plants.
EL2— Carla	● I pull out weeds by hands. I sprayed too. I didn't like weeding too much.	
EL3— Jenna	● We pulled out weeds and threw them away. We didn't use any spray...Some people made Dandelion wine.	
EL4— Levi		
EL5— Lana	<ul style="list-style-type: none"> ● I pulled out weeds by hands. I also used some weed killers. If I couldn't pull out, I sprayed them...Weed 	● I would be worried about my garden if the weather was too hot. I kept watering to save plants.

were very annoyed

- When dandelions have seeds and fussy stuff, it is the worse time of the garden.

- It was hard to keep upright hydrangea bushes; they fell over, and we tried to put sticks to tie them up.

That was the most frustrating thing alongside the house because they were falling over.

EL6— Paula	<ul style="list-style-type: none">● To get rid of weeds, I sprayed. If you really want to get rid of them, you get their roots out of the garden. They won't come back again.● Dandelion's flowers look nice but after their flowers fade, they are not pleasing.● There were wild animals in my garden. I forgot their name. They used to eat my tomatoes. My daughter told me that I could splash some beer around the plants to stop them. It worked!	<ul style="list-style-type: none">● I would be worried about my plants if there was no rain or it was too hot.
EL7— Sally	<ul style="list-style-type: none">● I used to spray bleach by the sidewalk. I also pulled out weeds and killed them. It was just the side walk areas. There was a space between our house and neighbor's. My mom cleaned a lot in that area. She pulled out weeds.	<ul style="list-style-type: none">● My sister has a garden and she grows a lot of flowers too at her house. Her flowers died in the last season because the weather was too hot and there was no rain. She did water though. This year, she got new plants, and they were all right.

Work ethic

	Never-ending tasks	Doing everything yourself
Silver Life		
SL1— Martin		
SL2— Clark		
SL3— Mary		
SL4—Ella	<ul style="list-style-type: none"> ● I used to wake up at 6 am and work in my garden for several hours...When I lived in my house, I had to wake up early to take care of plants...You need to spend a lot of time to take care of vegetables. 	
SL5— Wendy	<ul style="list-style-type: none"> ● Sometime I spent one hour a day and sometime four hours a day depending what needs attention. ● You have to check the garden two or three time a week and look around the yard. You pull out what needs to be pulled out. 	
SL6— Dolly	<ul style="list-style-type: none"> ● I spend a lot of time on gardening. I don't quite remember how much time I spend specifically. I enjoyed gardening so I spent a lot of time doing it. 	
SL7— Emma	<ul style="list-style-type: none"> ● Weeds come out every day. You have to do something with them every day. 	
SL8— Aaron		
SL9— Isabelle		
SL10— Beth	<ul style="list-style-type: none"> ● You keep pulling out weeds until you don't see them. 	
SL11— Amber		
SL12— Cindy		
SL13— Adam	<ul style="list-style-type: none"> ● (daughter's comment) My parents would spend hours and hours a day in the garden. They kept pulling weeds up, keeping the ground tilted a little bit and loosing the soil. ● I worked in the garden. I didn't enjoy gardening. I just worked years after years. She did. My wife enjoyed gardening. It was hard work. ● Weeds popped out. I didn't care. I just kept pulling them out..I spent a lot of time in my garden. 	<ul style="list-style-type: none"> ● (daughter's comment) He planted his own trees; if his trees dies, he dug out by himself with a truck after a truck after a truck...He was kind of doing-it-by-yourself person...He can do electrical, plumbing and woodworking. He was a master of everything.
SL14— Jane	<ul style="list-style-type: none"> ● If I noticed that weeds were coming out, I would go out and pick up weeds. 	<ul style="list-style-type: none"> ● If everything grew so well, it was a great accomplishment. We used to bring flowers in the house and eat fresh vegetables. It was good to have things you made by yourself. I felt proud of myself too.
SL15— Ana		<ul style="list-style-type: none"> ● I did a lot of gardening. I did a lot of things. I was interested in art for a while. I made my two lamps and put them together. The shade didn't come in time. If I got shade, the lamps would be complete and I would get the first price. I got a second price. I liked to paint. My husband never painted the room but I painted the whole house. I would do anything I could do in my hands. I also did a lot of sewing. I made my children's clothes. I knitted. I made their sweaters. I made my two daughter's wedding gowns with long train and beads. I made my husband's jacket.

SL16—
Carol

- At the bottom of the painting (painting of her garden) is my grandfather's house. He ran around the town and brought woods. He made a cabinet and my dad slept in that when he was a child.

SL17—
Jimmy

SL18—
Tina

SL19—
Joan

SL20— ● It had a lot of work to do in the garden...There was a
Molly lot to cut and to be taken care of.

SL21— ● We used to spend in the garden almost all day. We
Tim had to pull weeds.

Golden Age

GA1— ● I love gardening. I love my hands getting dirt. I never
Allie wore gloves. I grew up in a farm. Since I was four years
old, I have learned growing vegetables. We had lands.
You won't get tired if you do something you really
want to do.

GA2—
Chuck

GA3—
Erin

GA4—
Fox

GA5—
Flora

GA6—
Gale

GA7—
Gina

GA8—
Jak

GA9—
Judy

GA10—
Kyle

GA11—
Leon

GA12— ● I spend a lot of time, as much as I could in the
Maya garden.

GA13—
Portia

GA14—
Paul

GA15—
Ross

Elderly Living

EL1— ● If you don't weeds, they will take over the rest of
Aggie the garden.
● You always have fresh stuff and you always have
something to do.

EL2— ● I used to work in the garden for a couple of hours in
Carla every morning.
● I used to think of things that need to be done when I
looked at my garden.

EL3—
Jenna

- There was never enough time. I used to spend at least an hour a day and several days a week. I would garden in the morning or evening depending on children's schedule.
- I like to keep myself busy in all different types of things.
- I started gardening when I was married. I could have something to do. I was the person creating my garden at home. The garden was at the back side of my house. My mom used to have a garden before.

EL4—
Levi

EL5—
Lana

- I used to spend one or two hours a day in the garden.

EL6—
Paula

- If weeds came back again, I thought I didn't did a good job to get rid of them.
- I used to spend some hours in the garden every day in the morning and evening. I cannot stand the sun. I got sunburn too easily.

EL7—
Sally

- My parents spent two hours in the garden with watering and other things a day. Pulling weeds became their routines of everyday.

Hard work

	Physical demands	Starting from scratch	Learning new things
Silver Life			
SL1— Martin		<ul style="list-style-type: none"> ● After the winter, the ground is kind of hard. Digging things is very difficult. You have to break it in spring time and start all over again. 	
SL2— Clark	<ul style="list-style-type: none"> ● My parents spend quite a lot of time in gardens. They made everything with bared hands. 		
SL3— Mary	<ul style="list-style-type: none"> ● My husband went to the garden a couple of times a week to pull weeds. He pulled weeds and their roots by hands. Otherwise, they would come back. 		
SL4— Ella		<ul style="list-style-type: none"> ● I made poles for beans so they can climb up the stick. 	
SL5— Wendy		<ul style="list-style-type: none"> ● Before planting flowers, I would have some ideas and look at some pictures. ● At back of our house, we created our six-foot area with different plants. We also had flowers around our garage, at front of our house and between driveways with houses next to us. 	<ul style="list-style-type: none"> ● I used to pay attention to Sunday newspapers and TV programs about gardening. ● I used to drive to the countryside and see other people's home. I wanted to know how they keep their home attractive. ● I used to visit nurseries very often. I looked around and asked questions.
SL6— Dolly	<ul style="list-style-type: none"> ● I ruined my shoulder because I fell into tomato bushes. I had six big tomato plants and they had tomatoes more than what everybody needed. ● When I gardened, I had to kneel down and bend body. Gardening is a hard work but it is a good exercise 	<ul style="list-style-type: none"> ● I had a friend. He was a good landscaper. He helped us to plan a whole yard with petunia and different flowers. ● I grew tulips along the house...I made poles and let cucumbers climb up at the center of the pot. ● My mother used to grow marigolds from seeds, a very special kind. We grew in her greenhouse and transplant them to the garden. I also grew a lot of flowers from the seeds. I also went to nurseries and picked up whatever I like. 	<ul style="list-style-type: none"> ● I collected paper clips about organic gardens and a couple of magazines.
SL7— Emma	<ul style="list-style-type: none"> ● I used to spend so much effort and I liked to see plants growing so well. 	<ul style="list-style-type: none"> ● I made my container gardens. The garden was not big, about half size of this room. 	
SL8— Aaron			
SL9— Isabelle		<ul style="list-style-type: none"> ● In spring, I used to go to nurseries and picked up flowers. 	
SL10— Beth	<ul style="list-style-type: none"> ● I didn't use gloves. I didn't care whether the roses have thorns. There is always a way to get rid of things. 		
SL11— Amber		<ul style="list-style-type: none"> ● We always had some raspberry bushes when we live in Wisconsin. When we lived in Texas, he started a new garden and went to a nursery to buy some raspberry bushes. Then people in Texas really laughed at him and my husband said, "when the first raspberry starts coming 	

	out, I eat in front of you". Surely, we did get some raspberries.	
SL12— Cindy	<ul style="list-style-type: none"> ● I am too tall. I used to kneel down to do gardening. ● I put fence around my garden. 	
SL13— Adam	<ul style="list-style-type: none"> ● (daughter's comments) They pulled weeds by hands and got down kneels. They got some tools and pulled weeds up. That requires bending, your hands and knees. ● (daughter's comment) He planted his own trees; if his trees dies, he dug out by himself, a truck after a truck after a truck...He was kind of doing-it-by-yourself person...He can do electrical, plumbing and woodworking. He was a master of everything. ● I brought fence and put around for peas and beans and put wire and wood sticks for tomatoes. ● (daughter's comment) They grew something from the seeds; They started seeds in the house during the winter so they can transplant them in the spring . They also brought some which are hard to get start from nurseries. 	
SL14— Jane	<ul style="list-style-type: none"> ● We did have a space we built up for some things. I pulled weeds and watered the plants by myself. Nobody helps me. ● We brought the wire things to support tomato plants so they could twist around. 	<ul style="list-style-type: none"> ● When I brought my first house, I didn't know anything about gardening. I found a mix of flowers in my yard and I planted them. My neighbor knew a lot of gardening; she looked over my fence, and said, "What are you doing?" I said, "I am weeding". She said, "Do you realize you are leaving the weeds growing and you are getting rid of your flowers." That was how bad I was. I won't admit it at that time. After years, I started to admit it. ● There was a woman in my neighborhood, who had a large garden space full of flowers. She knew how to plant them ---the tall flowers right back at the fence and their height went down to the front. It was just beautiful. I went there to see her garden every year. She knew what she was doing. I appreciated it. The colors were just beautiful.
SL15— Ana	<ul style="list-style-type: none"> ● I love peppers. I used to tie them with something so they wouldn't fall out. ● I sometime started with seeds or roots. 	
SL16— Carol	<ul style="list-style-type: none"> ● My wife decided what we grew in the garden. ● I brought seeds from nurseries and made ground loose and nice. Then I just put seeds in there and covered them with soils. 	
SL17— Jimmy	<ul style="list-style-type: none"> ● My wife created and took care of the garden. I helped her sometimes. 	
SL18— Tina	<ul style="list-style-type: none"> ● We just grew peas on the ground and put a stick. We grew onions from onion sets. 	
SL19— Joan		
SL20— Molly	<ul style="list-style-type: none"> ● My husband made fence for the garden. 	

SL21— Tim	<ul style="list-style-type: none"> ● In winter after we shoveled snow, we made barn cleaning, cattle feeding, milking and other chores. We went to bed earlier and waked up at 4 am in the morning. We had to get the dogs to shepherd the cow and pull weeds in the garden 	<ul style="list-style-type: none"> ● We built fences to keep cattle and crops in place.
--------------	--	--

Golden Age

GA1— Allie	<ul style="list-style-type: none"> ● Sometime I spend in the garden all day long. One time my neighbor told me, "If I follow what you did for ten minutes, I will be on my bed for a week." She had a backache. 	<ul style="list-style-type: none"> ● I created the garden by myself. I dug them all and put seeds in there. I took care of the garden by myself too.... I always had a big garden. The garden was at back of the house, 30 by 30 feet. ● I had some cages for tomatoes, otherwise, they would fall out. I bought them. ● I planted cucumbers on the fence I made and they grew on the other side of the fence. I just reach those and pick them. My neighbor didn't care.
GA2— Chuck		<ul style="list-style-type: none"> ● We put some fertilizer.
GA3— Erin		
GA4— Fox	<ul style="list-style-type: none"> ● Watering took a lot of time. It was very difficult. ● We used to spend about one hour and half in the garden every day. 	<ul style="list-style-type: none"> ● I was the person creating my garden. I also took care of the plants. Nobody helped me. I took care of everything. ● We got plants from nurseries. We put fertilizer. ● I made sure that everything is in good shape.
GA5— Flora	<ul style="list-style-type: none"> ● We had to go out to do the work. I used to start from seeds; I pinched the seeds, a small amount of seeds with my two fingers. 	
GA6— Gale	<ul style="list-style-type: none"> ● I used to spend a couple of hours a day in the garden. I sometime spent half day in the garden. 	
GA7— Gina		
GA8— Jak	<ul style="list-style-type: none"> ● I pulled cucumbers. 	
GA9— Judy		<ul style="list-style-type: none"> ● We had tomatoes and had those wire things to protect them. ● We had a greenhouse. It was attached to our house. Most of plants stayed year-around. My parents would pick up seedlings from the green house and plant in the garden. They also kept herbs in the greenhouse. When you need something, you just go there to pick up what you like. We have herbs year round.
GA10— Kyle		
GA11	<ul style="list-style-type: none"> ● I worked in a greenhouse 	

—Leon before. I used to take down plants and turn soils. I cut down plants so more sunlight comes in. I mainly worked with dirt.

- I used to pull weeds, mow lawn and take care of few plants...I used to water plants not every day.

GA12 — Maya	<ul style="list-style-type: none"> ● I took care of the garden. 	<ul style="list-style-type: none"> ● I put cucumber next to the fence. Some went up and other went straight down. ● I put certain colors together and made the garden like a rainbow. I used to like my garden with a variety of colors. ● I brought seeds from grocery stores...I used fertilizer sometime. ● You dig it, make ground soft, put seeds in, cover with soil and water. It is very simple.
-------------------	--	--

GA13 — Portia	<ul style="list-style-type: none"> ● I spend a couple of hours a day in the garden...I had to water them. ● I am not afraid that hands get dirt. I used to do gardening with my bare-hands. 	<ul style="list-style-type: none"> ● We would use some fertilizers and mix with soils.
---------------------	---	---

GA14 —Paul	<ul style="list-style-type: none"> ● I used to have one sprinkle. I set up by myself. 	
---------------	--	--

GA15 —Ross	<ul style="list-style-type: none"> ● I spend many hours in my garden. I used to watch the garden like a rock. I put a lot of time and effort in my garden. 	<ul style="list-style-type: none"> ● I fixed the house by myself. ● I put fence around the garden so animals didn't eat my garden. ● Every year, you take some stuff out and bring some stuff in and you hope they grow as well as before.
---------------	---	---

Elderly Living

EL1— Aggie	<ul style="list-style-type: none"> ● Keeping weeds out is very difficult. 	<ul style="list-style-type: none"> ● We put sticks for pole beans. ● We used to start many things from the seeds. Even the tomatoes, we started from the seeds...We had a lot of peppers. When they turned red, we took out their seeds. When you take out tomatoes seeds, let them sit couple of days and put them to dry. ● We had cows. We put fence for the cow. You kept the cows in.
---------------	--	---

EL2— Carla		<ul style="list-style-type: none"> ● I used to go to nurseries to pick up plants that I like. ● We put fence between yards.
---------------	--	---

EL3— Jenna	<ul style="list-style-type: none"> ● When I had a garden for myself, I just enjoyed it. It was a hard process but a wonderful process. I didn't mind dirt getting in my nail. You could just take the dirt out. It was nice that you can always see something different and something growing. ● I used to do gardening with my bared feet and hands. 	
---------------	---	--

EL4— Levi	<ul style="list-style-type: none"> ● I wear gloves. I don't mind my hands get dirt. 	
EL5— Lana	<ul style="list-style-type: none"> ● Gardening requires a lot of bending and kneeling. I had two cushions. One was for me and the other was for my wife. 	<ul style="list-style-type: none"> ● My wife was the one deciding types of plants in the garden. We went to nurseries and picked up whatever we like. ● We put sticks beside hydrangeas and used ropes to make frames. We tied them up and prevented them from falling over. ● We used to collect seeds from plants and grow them for the next year. ● We put fence between our and neighbor's yard.
EL6— Paula	<ul style="list-style-type: none"> ● I had a back surgery and I couldn't bend down but I would sit down. I would sit down and pull weeds. 	<ul style="list-style-type: none"> ● I created my own garden... I brought small plants of tomatoes in a nursery. ● I grew some vegetables like radishes and lettuces from the seeds. ● I put flower beds along the border.
EL7— Sally		<ul style="list-style-type: none"> ● My parents used to put fertilizer and mix that with soil. ● We put fence along the backyard.

Feedback

	Self-value & satisfaction	Physical health	Relaxation
Silver Life			
SL1— Martin	● I felt so good that I could just pick up tomatoes in my garden and eat them.		<ul style="list-style-type: none"> ● I spend 40 minutes a week in my garden during summer. Not much but I liked to spend some time in the garden after work. ● I liked to sit on my patio and read and write. My garden was pretty. I felt relaxed when being in the garden. I didn't feel I have any responsibility or the load of gardening. The garden was small; I didn't have a lot of work to do. I just feel relaxed.
SL2— Clark			
SL3— Mary			
SL4— Ella	● I felt happy when I looked at my garden and looked what I made.	● Ginger is good for your stomach and hair. I used to wash my hairs with ginger. It made my hair shining.	
SL5— Wendy	● I used to have a nice garden. I enjoyed it and so did my husband and friends.	● Gardening was a good exercise to me.	● I felt relaxed and peaceful when sitting in my yard and looking at my garden.
SL6— Dolly	<ul style="list-style-type: none"> ● When something I look forward to came true, I felt so great. ● I liked to grow things and to see something different...I felt satisfied and proud of myself when enjoying the vegetables I grew by myself. 	● When I gardened, I had to kneel down and bend body. Gardening is a hard work but it is a good exercise. I liked to be at outdoors to enjoy fresh air.	● I felt serene when sitting in my garden.
SL7— Emma	● I felt good and proud when we enjoyed vegetables I grew by myself on the table. I also felt happy when things grew so well.	● Gardening is a good exercise. You move things around.	● When I stay in my garden, I prayed and I felt relaxed. The garden was very peaceful.
SL8— Aaron	● I still remember that my dad took a lot of pride of what he had been doing in his farm.	● Mowing the lawn was good exercise to me.	
SL9— Isabell e			
SL10— Beth	<ul style="list-style-type: none"> ● The taste of tomatoes we grew was pretty much the same with the store tomatoes but we like our own tomatoes. I could have tomatoes in my garden anytime I wanted. ● I liked working with dirt. That was how I appreciate everything. The more you put in the more you respect out of it...When you grow something by yourself, you will appreciate the food. 		
SL11— Amber	<ul style="list-style-type: none"> ● When we ate food we grew by ourselves, we felt proud of it and felt good about it ● We were so happy when vegetables grew so well because we would have 		● I felt quiet and peaceful when sitting on the patio and looking at the garden.

	something to eat.	
	● My husband just enjoyed being outdoor so he kept doing gardening years by years.	
SL12— Cindy		● I enjoyed fresh air.
SL13— Adam	● I liked vegetables I grew. They taste better.	
SL14— Jane	● I just felt self-achieved. The food was so good. If I wanted to eat, I could just go to the garden and grab some. ● If everything grew so well, it was a great accomplishment. We used to bring flowers in the house and eat fresh vegetables. It was good to have things you made by yourself. I felt proud of myself too.	
SL15— Ana	● When everything grew so well, I called my husband to look out windows. I yelled and said, "Oh! Look at the rain! Everything is going to become so nice." ● I felt good when I ate my vegetables. I planted them and kept them going. I was proud of myself.	
SL16— Carol	● I felt proud when I looked at my flowers...I liked to watch things grow so I had gardens years after years. Plus, I could have fresh vegetables. ● I thanked God for making my vegetable grow so well. They can't grow by themselves. You have to thank God.	
SL17— Jimmy		● I felt peaceful when I looked at my garden. I would feel better if I was not asked to do gardening.
SL18— Tina		
SL19— Joan		
SL20— Molly		
SL21— Tim		
Golden Age		
GA1— Allie	● I felt very happy. Keep growing! Keep growing!	
GA2— Chuck	● I felt good when I ate my own vegetables. ● I felt alright and felt good when sitting in my garden.	
GA3— Erin		
GA4— Fox	● I had a good feeling when flower grew very well.	
GA5— Flora	● I felt very good when eating something from the garden. My mom used to have several recipes; she	

	canned things or made jam out of things from the garden. That was good.		
GA6— Gale	<ul style="list-style-type: none">● You would have feedback, self-worth and pride by doing gardening. You definitely get your fulfillment from the garden, the food and fresh taste.● If things grow so well, you want to thank Mother nature because you are not doing by yourself. There is a lot of involvement; it is not just your effort. You cannot control everything.● In the gardening concept itself, you know you are going to get something back from your input. It is a circle.		
GA7— Gina			
GA8— Jak			
GA9— Judy	<ul style="list-style-type: none">● Doing gardening was healthy for me. One thing was that I could get fresh air. Now, I seldom go out; I am getting old and lazy.	<ul style="list-style-type: none">● I felt relaxed when sitting in my garden.	
GA10— Kyle	<ul style="list-style-type: none">● I enjoyed looking at my garden.		
GA11— Leon			
GA12— Maya	<ul style="list-style-type: none">● I felt satisfied. My vegetables taste twice as good as they should be.● I enjoyed doing it and enjoy eating it... I think home-grown tomatoes taste better because they are results of your own labor. Those are your reward for your work.● I felt proud when looking at my garden.		
GA13— Portia	<ul style="list-style-type: none">● I felt I did the right things if things grew well.● I felt very proud of my garden. I felt I accomplished something.	<ul style="list-style-type: none">● Gardening was a very good exercise to me. Plus, you can some fresh air.	<ul style="list-style-type: none">● I felt I could get out of the house for a while.
GA14— Paul			
GA15— Ross	<ul style="list-style-type: none">● People used to knock my door or stand by my door and said, "God, that is beautiful."● You got a lot of respect and compliment because of the garden.● My garden is a part of me. Anything that is a part of me is me.		
Elderly Living			
EL1— Aggie	<ul style="list-style-type: none">● You always have fresh stuff and you always have something to do.● You felt good that you had your own garden and you could save some money.● I liked to see useful things growing.		
EL2—	<ul style="list-style-type: none">● I felt happy when eating my own	<ul style="list-style-type: none">● My garden was very quiet. I could have	

Carla	<p>vegetables.</p> <ul style="list-style-type: none"> ● I liked to see things germinating and growing. It kept me doing gardening. ● I felt sad if the vegetables didn't grow well. 	my own time.
EL3— Jenna	<ul style="list-style-type: none"> ● When I saw plants growing from seeds, I felt peaceful and rewarded...Flower blooming is very beautiful, representing piece of nature out there ● For a while, I used to have indoor plants. I got up early on Sunday morning. Everyone was still in sleep but I was awake. That was my quiet time. I went to the kitchen and get my fingers all black in the soil or repotting things. I only had four plants by the windows but that was fun. ● I loved success of being able to harvest something and cook for my family. I felt very proud of myself. I think that is why gardening is so interesting. We have chances to see how nature takes over. 	
EL4— Levi	<ul style="list-style-type: none"> ● I liked to do gardening because I liked to see what I could do with the garden. 	
EL5— Lana	<ul style="list-style-type: none"> ● I liked that I could eat vegetables I grew by myself. Plus, I have to like the food because my wife was the cook. ● I felt good when things grew so well. 	<ul style="list-style-type: none"> ● We sat down and looked at the garden. We could see different colors together, and the garden was pleasing and calming.
EL6— Paula	<ul style="list-style-type: none"> ● I felt so good that I could eat fresh tomatoes from my garden... It was good that you can have something to eat from the garden. 	<ul style="list-style-type: none"> ● I felt relaxed and pleasure that my garden was doing so well. I felt sad when things were not doing so well.
EL7— Sally	<ul style="list-style-type: none"> ● If they didn't grow well, you would feel disappointed. 	<ul style="list-style-type: none"> ● When I was in the garden, I felt relaxed. It took all your stress away. ● We used to sit, read and relax in the garden.

My home

	Family tradition	Dwelling and resting	Playground	Gardens as part of life	Home at present/self at present
Silver Life					
SL1— Martin	<ul style="list-style-type: none"> ● My father taught me how to grow tomatoes. When he got home from work, he worked in the garden for tomatoes. Like father like son. I am like my father a lot. He was a banker, living in suburban of Boston. 	<ul style="list-style-type: none"> ● We put furniture on the patio. We could see the garden from the patio. I had a grill for cookout. We sometimes had lunch and dinner at outside. 			
SL2— Clark					
SL3— Mary	<ul style="list-style-type: none"> ● My parents had been growing things through years and years. They learned from their parents. Everybody had a garden many years ago. 				
SL4— Ella		<ul style="list-style-type: none"> ● I put chairs on my patio so we could sit. 			<ul style="list-style-type: none"> ● I felt happy when gardening. Talking about my garden makes me homesick.
SL5— Wendy	<ul style="list-style-type: none"> ● My husband's grandparents knew how much I like their yard. When we brought our first house, they were willing to help and teach me about gardening. I also learned by myself. 	<ul style="list-style-type: none"> ● We had a house so we wanted to do something about the yard. ● We had a big lawn and we put outdoor furniture. Sometime we had dinner or lunch at outside...I read a lot in my garden ● We have our driveway coming to the garage at the side of the backyard, and so often, we had friends coming over. We put chairs at our driveway. ● We sat and had a drink. We used our driveway as outdoor patio. ● At our back yard, we had two elm 			

		trees and one birch tree so we had a lot of shade.	
SL6— Dolly	<ul style="list-style-type: none"> ● I learned gardening from my mother. She had a garden and a greenhouse attached to her home...She was a great gardener. I learned a lot from her. 	<ul style="list-style-type: none"> ● We had few chairs outside on a small cement patio. ● We kept a mountain ash tree so we had some shade for the house. 	
SL7— Emma	<ul style="list-style-type: none"> ● My dad taught me how to garden. I think he was a good gardener. He had some flowers. I learned from him. 	<ul style="list-style-type: none"> ● I had some patio furniture and sometime we sat outside. 	<ul style="list-style-type: none"> ● I never stop doing garden until I felt it is hard to do. I really love gardening and see things growing. ● I can't do gardening now. I am in a wheelchair.
SL8— Aaron			
SL9— Isabelle	<ul style="list-style-type: none"> ● There was always somebody to take care of the garden when I was a kid. I went outside and watched. 	<ul style="list-style-type: none"> ● I started my own garden after my husband and I got a house. ● I had two gardens. One was for the winter home and the other was for the summer home in New Hampshire. 	
SL10— Beth	<ul style="list-style-type: none"> ● I would feel lost if I didn't have a garden because my mom always had a garden and we had two long gardens. We always had them until we moved away but we always had gardens. 	<ul style="list-style-type: none"> ● We did have chairs. We liked to have a place to sit. I didn't have a table outside... Kids had their place and dogs had their place outside. 	
SL11— Amber		<ul style="list-style-type: none"> ● My husband built an enclosed porch on our patio. Everything was screened so I wouldn't get any allergy...we put furniture and a grill for outdoor BBQ. ● We got a lot of sun in our garden but it was pretty cool to stay on the porch. We got nice breeze. 	<ul style="list-style-type: none"> ● After my husband died, I couldn't take care of the garden, no more. I sold the house in Texas and moved back to Wisconsin. ● I miss my garden, I miss that I can do things and I miss my baking. One time, I wanted to price my brownies but I was unable. When I came here, my relatives threw all my recipes away so I don't have them but I do have a recipe for potato soup. That is a very good one. After my husband died, I moved to Milwaukee. There was a position open at one restaurant so I went

It was very comfortable even if the temperature hit 90 degree.

for it. I got the job. I was cooking for potato soup. I had a recipe of peanut butter cookies I learned from a magazine. I shared it with staff here. It only takes three ingredients: one cup of sugar, one cup of peanut butter, and one egg. You mix them all together and place them on an ungreased cookie sheet. You bake them with 350 degree for eight to ten minutes. That's it.

SL12— Cindy		● I tried dandelion wine but I didn't like it.	
SL13— Adam	● (daughter's comment) We got sun all day long in the garden...There was no place to sit. It was just a place of garden and work.		● I used to enjoy gardening but not anymore now. I don't know why.
SL14— Jane	<ul style="list-style-type: none"> ● The driveway was at the south side. We put our chair over there. ● I had verbenas when I lived in a condo. I had a small patio and kept verbenas over there. 	<ul style="list-style-type: none"> ● I didn't have petunias. They were put on my sister's grave. She died when she was a baby. We always put petunias on her grave. 	<ul style="list-style-type: none"> ● I did all gardening before 37 years old. After that, I got a brain tumor removal and I had to sit in a wheelchair. That is why I can't no longer to do those things. Well, at the first, I was able to get out of my wheelchair and sit on the grass and get rid of weeds. That was when I was young and I knew how to get back to my wheelchair. As years went by, when I turned into 50, I was unable to do that anymore. ● I used to live in an assisted living facility. They had some raised planters where we could plant things but I never did. I don't know. I just never did. I don't know why I just never did. They have a box here with yellow cherry tomatoes; they are acid-free and tiny. I love those.
SL15— Ana	<ul style="list-style-type: none"> ● I brought four little pigs about this big. When they got bigger enough, I have them breed. One night, they gave birth and I had 57 		<ul style="list-style-type: none"> ● I miss the whole farm and little pigs. My little pigs were so cute.

	baby pigs. It was January and the weather was cold so I piled the straws and put light.		
SL16— Carol	<ul style="list-style-type: none"> ● My parents used to live in Indiana. They had a garden. They taught me how to garden. 	<ul style="list-style-type: none"> ● We cooked dandelions. My grandmother cooked them. She just fried Dandelion leaves with bacon grease. 	<ul style="list-style-type: none"> ● I used to grow fresh tomatoes in my garden. I miss the taste of my garden.
SL17— Jimmy	<ul style="list-style-type: none"> ● Maybe my wife's parents teach her how to garden. 	<ul style="list-style-type: none"> ● We had a patio. We got breeze in summer. We used to have dinner or lunch outside once in a while. ● My wife is interested in gardening. She made gardens for our home. 	
SL18— Tina	<ul style="list-style-type: none"> ● I always like gardening. My mother was a gardener too. She taught us how to garden. I just watched her and learned things. I had to learn how to do things. 		
SL19— Joan	<ul style="list-style-type: none"> ● I had a patio at home for some furniture 		
SL20— Molly	<ul style="list-style-type: none"> ● I had chairs on my patio. We used to sit in the sun. 		<ul style="list-style-type: none"> ● My favorite thing is cook. I used to cook things grown from my garden. I love cooking but I don't have any chance now. I live here.
SL21— Tim	<ul style="list-style-type: none"> ● (brother's comment) Older brother cut wood for the winter for heating the houses. We didn't have natural gas at that time. I was born in 1931. I am the youngest. We had electricity at 1937. Before 1937, you kept whatever you made like canned tomatoes in the basement. We kept potatoes at the basement because it was very cool. They 	<ul style="list-style-type: none"> ● (brother's comment) Our farm and home was in Minnesota. It was colder than here. The last time he did gardening was around 1939. ● (brother's comment) We cook everything from our farm. We had a wood stove in the living room and also in the kitchen for cooking. It warmed the kitchen. The heat went into bedrooms...Our bathroom was 75 feet away from our house. It was just a little house and a hole on the ground for your duty. ● We had to shovel everything from the house to the farm during winter time. We had to 	<ul style="list-style-type: none"> ● We used to go from our barn to milk house. We had to make milk. We feed sour milk to horses. I still miss the time and wish I could go back to the farm.

would last.
Otherwise, we had
to put everything
else in jars.

shovel probably 200 feet. We
didn't have snowplow. The
snow bank we dumped our
snow was above 200 feet for
just trying to get a pass.
● We used to sell rutabagas
and tomatoes and earn some
cash.

Golden Age

GA1— Allie	<ul style="list-style-type: none">● I didn't have many flowers in my garden. Some flowers were at the edge of the garden along the property line.	<ul style="list-style-type: none">● There was a small cat that I used to watch when I worked in my garden. I called her Mama because she had kitten ever year. She had kids about three times a year. She was somebody's cat but they moved away and they just left her. She has black yellow spot. She just hanged around and liked watching me in the garden. One day, when I went into the house, she followed me so she became my pet. The last time she gave birth was on a day at 5 or 6 am. She stayed next to my bed on the floor. She was pooping because she was so old. I kept one of her kittens. His name is Blacky. Blacky was such a sweet little kitten. She stayed in my house for 27 years. I used to smoke before going to bed. I would open the window and I blew the smoke. She smelled the smoke. As I call, "Blacky ~" She would run with a 150-mile per hour speed and come down to the side of the fence. Immediately, she showed in my kitchen...She can't be dead. I was crying and crying. I got to bury her. It was too hot. I was thinking at least, I need to do something for her. I found a little soft bed in the house and I carefully put her in the bed and I took her outside. I start digging a hole...pretty deep..(Crying). I carefully laid her on the bottom. "Goodbye, Blacky!" My little sweet friends!	<ul style="list-style-type: none">● I always had a garden at home. This year is the first year I don't have my garden● A house is not a home if it has no garden.	
GA2— Chuck	<ul style="list-style-type: none">● I sometime pulled a chair and sat in my garden.● I built fence around the yard.	<ul style="list-style-type: none">● My mom and dad had a garden. They grew some vegetables. They had one milk cow.		
GA3— Erin	<ul style="list-style-type: none">● Our farm is about 100 acres. That was my grandfather's farm. He was dead.● We had palm trees. People would sit under the palm trees. I felt very comfortable to sit in the shade. We would have some lemonade. It was very good.	<ul style="list-style-type: none">● Do you know t there is a "Big Boy Tomato"? They are so big. They are one of beef steak tomatoes. They are so big. They would fall over and my dad would just plow them over. We would run down, pick them up and wash them. We would put some salt and eat them (laughing).	<ul style="list-style-type: none">● We had horses and cow. We would feed horses with some corn every day.● My mom raised chicken, red and white Leghorn chickens. She would pick up white eggs and brown eggs every day.● We had cows, Jersey cows. They had white face. We used to milk them.● My dad would sell the milk but he	<ul style="list-style-type: none">● When I think about my home, I miss my mom and dad. She died before Thanksgiving and he passed away in July. He had a heart problem. People brought him to a doctor in

		<p>We liked that. It was fun.</p> <ul style="list-style-type: none"> ● We had a big old shepherd. He used to play in the farm. He was very smart. He liked to play with my brother. 	<p>didn't have much to sell.</p> <ul style="list-style-type: none"> ● I had three sisters and two brothers. My dad's brother has three sons and one dog. We used to play in the farm. 	<p>town. I still remember the doctor's name...</p>
GA4— Fox	<ul style="list-style-type: none"> ● My mom taught me how to garden. 	<ul style="list-style-type: none"> ● I had lawns in front of my house. The garden was facing south so it got a lot of morning sun. 		<ul style="list-style-type: none"> ● I don't miss my garden. That was long time ago.
GA5— Flora		<ul style="list-style-type: none"> ● Taking care of my garden was my responsibility. ● We used to put furniture on the porch and sit outside in the breeze. There were a lot of mosquitos. I liked to sit on the porch looking at outside. My mother used to open the window to get breeze as we ate in the kitchen. 	<ul style="list-style-type: none"> ● My mon used to do a lot of gardening. The garden was so small. It was a part of home. ● My dad used to have a thousand of chickens. He would sell them when they grew up. They would lay eggs and those were our income. ● We would have to weed and feed cows and a thousand of chickens with weeds... We had some goats...We also milked the cows. 	
GA6— Gale		<ul style="list-style-type: none"> ● My dad did some decoration around. He put chairs and did plants. ● He put fence around the garden. 	<ul style="list-style-type: none"> ● My father used to have a small garden. My mom liked to grow some flowers. ● My father was really into nature. He brought us to mushroom hunting around swampy in the spring. We needed to know where they were going to pop up under leaves. They were there for natural growth. We usually carried a pocket knife and you cut them off. You take them home and wash them. ● I had responsibility of taking care of the garden. 	
GA7— Gina				
GA8— Jak				
GA9— Judy	<ul style="list-style-type: none"> ● We had a screen-in porch. In summer, we would put chairs and sit on the porch. 	<ul style="list-style-type: none"> ● My grand grandfather was a farmer too. He has a twin brother. They married sisters. I was just a little girl. He used to make a crown of dandelions. That was funny. They are weeds. When you blow the flowers, they fly. ● My brother, when he was a kid, he used to eat corn like a typewriter. It was funny. He loves corn ● My brother used to have a dog, a German shepherd. He was in a farm but was shot. My brother sent him 	<ul style="list-style-type: none"> ● My mom used to have a victory garden. She only had flowers. ● My grandfather was a farmer. In the backfield way up to a pine tree, there were some flowers. You cannot pick them up anymore because they were indigenous. Only few of them were left, and people want to preserve them. When I was a young lady, we used to make baskets. We would pick up flowers and put in baskets but you cannot do that anymore. ● I got gardenias for my graduation. Those were nice. ● My nana took care of me. She was a good gardener and cook. She used to 	<ul style="list-style-type: none"> ● I miss my garden but I have to accept that is long gone. I miss the pine tree that we used to make decoration. I miss that we could do something. ● Doing gardening was healthy for me. One thing was that I could get fresh air. Now, I seldom go out; I

		to a vet but he still lost one leg. Anyway, he was a part of our family. We had a white cat. When we were kids, we dressed the cat with dog's clothes and ran away. That was funny.	make donuts and save the hole for me. I would put in a paper bag.	am getting old and lazy.
GA10— Kyle	● My wife taught me how to garden. She was good at it. Her parents taught her how to garden. Her parents were great gardeners.		● We found everybody likes tomatoes so we grew a patch of them. We sold tomatoes like crazy.	
GA11— Leon				
GA12— Maya	● My grandparents used to have a garden. When they were gone, we kept it. It was just a small garden but their yard was big. The garden was along the house and garage.	● I used to have chairs at the front porch. We even had a swing. ● I had a garden back of my house... We had a fence between the yards.		● You make me thinks of old days!!! I miss my garden, definitely. There is nothing that is fresher than those you pick up from your garden.
GA13— Portia				● I miss my garden.
GA14— Paul		● My house used to have some maple tree around and grass. The yard was very hilly. I had a front porch. I could see the street from the porch. ● We owned the house. Mowing the lawn was our responsibility.		
GA15— Ross		● I had different kinds of fence.		
Elderly Living				
EL1— Aggie	● My mom and dad taught me how to garden. I could go and plant the garden but they wouldn't let me do it.	● We had more than one garden. Some were at the back and others were at the front of the house. We had 50-acre field but it wasn't all for gardens. We had a lot of trees. No other house was around. We had a porch at the front. ● We put some chairs on	● My neighbor used to have a coal mine. They used to use coal to burn the furnace. Whey they were getting old, they had my dad dig coal for them and for us. My brother and my dad used to dig the coal. When my brothers left home, all girls went to the coal mine with dad every day. You moved the dirt to get the coal out. ● My dad once brought a new tire for the car and he hit in the barn and	● I like onion. I used to cook everything with onions. Here, we don't have any onion. I don't know why.

the porch. The land was so hilly so we couldn't put chairs outside.

covered with hay or straws. At that night, the dog barked so my dad finally got up and went to the barn to see if the tire is still there. He just dug out the tire from hay. It was there so he went back and went to bed but in the morning, it was gone. He said he shown them where the tire is. He didn't know who stole it.

EL2— Carla	<ul style="list-style-type: none"> ● I started gardening when I was married. I could have something to do. I was the person creating my garden at home. The garden was at the back side of my house. My mom used to have a garden before. 	<ul style="list-style-type: none"> ● I started gardening when I was married. I could have something to do. I was the person creating my garden at home. The garden was at the back side of my house. My mom used to have a garden before. ● I felt taking my garden was my responsibility. ● We had a patio. We put chair and table on the patio. I liked to sit at the patio looking at the garden...I used to read outside by the table. ● We had mulberry bushes. Kids used to sit out there under the tree. There were shades out there; it was like an umbrella. 		<ul style="list-style-type: none"> ● I miss my garden, the flower garden.
EL3— Jenna	<ul style="list-style-type: none"> ● I knew gardening because of my mother. I learned by watching her doing gardens. ● I didn't have squash and neither did my parents. I followed what my parents did. 	<ul style="list-style-type: none"> ● We had a big grass. We didn't have money to put furniture outside. We used to put a blanket. We had a porch but it was not big enough to enjoy things. ● I feel taking care of gardens was my responsibility because only me and my mother stayed home at that time. 	<ul style="list-style-type: none"> ● When I was younger, my father went to WII. He left home at age 30. We had a victory garden. I remember we went out to pick up peas, tomatoes, carrots and radishes for everyday life. We had a big backyard. We used to live at the edge of town and there was a big lot behind us. ● I feel taking care of gardens was my responsibility because only me and my mother stayed home at that time. ● My parent's garden was at back of the house. The house was at the corner so it would be expensive if we put fences. We just kept it open. 	<ul style="list-style-type: none"> ● I miss my garden. I miss that I was able to do gardening on my own. I could watch things growing and materializing. ● I had Scoliosis and it gets worse now because I always sit in the chair. It did bother my back. Of course, my knees hurt too. It is very difficult to me to bend my body.
EL4— Levi			<ul style="list-style-type: none"> ● My husband worked in a factory called Green Giant. We had a small garden. Our home was on the hill. We had a lake in front of the house. We had a train passing by because of this factory. Later, we opened a shop. 	
EL5— Lana	<ul style="list-style-type: none"> ● My wife taught me how to garden more or less. My dad did a lot of garden. He had a big 	<ul style="list-style-type: none"> ● I have started gardening since I was married and brought a house. ● The garden was at the back of the house. We had some flowers and bushes at the front and back 	<ul style="list-style-type: none"> ● My dad used to grow a lot of cucumbers for pickles. He put cucumbers in whisky bottles, and they grew and grew. He would 	<ul style="list-style-type: none"> ● I miss my wife and also my garden. They were a part of my life.

	garden with a lot of vegetables and flowers, especially vegetables.	of the house. A lot of flowers were grown at space by neighbor's house. ● The driveway was wider to the garage. We put a picnic table on the grass or place chair on the drive way. We set the space like a park. We manicured our garden. ● My house was north-south oriented. We got a lot of sunshine at the south of the house and in the garden. Our rhubarb grew so well in the garden.	broke up the bottle and have bottle-shaped cucumbers.	
EL6— Paula	<ul style="list-style-type: none"> ● My mom taught me how to garden. She brought me a garden book. I also learned by watching her doing her garden. ● My parents were gardeners. I have been gardening since I was young. My daughter likes gardening too. If she were here, she would enjoy talk to you. 	<ul style="list-style-type: none"> ● My parents, put furniture in the garden. We had a swing chair on our porch. ● I felt taking of my home garden was my responsibility. I enjoyed it. ● We had some shade areas. 	<ul style="list-style-type: none"> ● I still think about how fresh tomatoes I can have if I have my own garden. ● I got big tomatoes from my garden one year. The tomatoes were so big. Yes, beefsteak! They were so good and I was so surprised they got so big. We just grew them at sides of the house, not even in the garden. I am glad you remember the name, "beefsteak". I should write that down because I would never remember the name. 	
EL7— Sally	<ul style="list-style-type: none"> ● My sister learned gardening from my parents. My parents learn that from their parents. 	<ul style="list-style-type: none"> ● We could see the garden from the dining room or kitchen. We had a porch too. We could see the garden from the porch. ● Some gardens were at the front and mostly in the back. ● They put some furniture at the backyard. There was a patio space. Sometimes we had picnics outside of the house. That was fun. We used to cookout all the time. ● We used to sit, read and relax at the garden. 	<ul style="list-style-type: none"> ● My mom always said she poisoned plants. When she drank coffee, she gave plants coffee. She could grow anything. She talked to plants every day. She had green thumbs but I don't. My sister can grow plants too. My dad had green thumbs too. 	<ul style="list-style-type: none"> ● I do miss my parents' garden but I can go to my sister's house to see her garden now. Hers is small but still nice. My sister's garden is just half size of this room. She got gardens at the front of the house and she got some flowers at the back.

Appendix N: Rules of Silver Life's Courtyard

1. Staff as providers vs. residents as receivers

Staff as providers vs. residents as receivers (15 rules)		
Maintenance	SL.1.	Maintenance staff mow the lawn, clean the courtyard and replant flowers without residents' input.
	SL.2.	Except residents, staff, volunteers and family members are allowed to use hoses or water cans to water plants.
	SL.3.	Residents may do light gardening such as deadheading.
Service delivery	SL.4.	Nursing staff are to check residents at the courtyard when they need to take medicine. If residents are willing to stay longer, they will bring medicine to them. If residents need to go to the bathroom, staff will push residents back.
	SL.5.	Staff bring residents back to their rooms for washing up before dinner or after lunch.
	SL.6.	No staff check residents at the courtyard on a regular basis.
	SL.7.	Residents who like to go back to their room ask any staff who pass the courtyard to push them back or ask a family member to pass the information to staff.
	SL.8.	Most of nursing staff who pass the courtyard take initiative to check residents' needs in terms of water, sunglasses, hat and clothes and give feedback immediately.
	SL.9.	Staff check residents at the courtyard around noon to know if they like to have outdoor lunch. Residents at the courtyard may request outdoor lunch from any staff who pass by or ask family members to pass message to kitchen staff.
	SL.10.	Kitchen staff are to deliver meals to residents who order an outdoor lunch or breakfast. They also clean up the table after residents leave.
	SL.11.	No one checks whether food trays are brought back to the kitchen after meals.
	SL.12.	Activity staff check residents at the courtyard to see if they like to participate in an on-going indoor activity.
	SL.13.	Maintenance staff set up an outdoor grill for a private family cookout. They are to ensure everything is turn off and push the grill back to a corner of the courtyard.
Passive activity	SL.14.	Most of residents in the courtyard are either talking to others or observing or taking a nap. Some residents read a book or play a crossword.
Marketing	SL.15.	The courtyard is one stop of a tour in Silver Life. Services and activities in the courtyard are highlighted in the tour.

2. Little control of information

Little control of information (14 rules)		
Levels of visibility	SL.16.	Most of the individual users choose to sit at the edge of the patio observing nature and people.
	SL.17.	No semi-enclosed or screened seats are offered.
Flow of personal information	SL.18.	Residents and family members may talk about personal information related to money and health. Their conversation can be easily heard.
	SL.19.	Residents and family members may have intimate interactions under the eyes of the public.
The extent of information awareness	SL.20.	Some staff ask resident's preference of sun and shade before positioning them in the courtyard.
	SL.21.	Some staff ask residents whether they like to come back to the courtyard after bringing residents to the bathroom but others do not.
	SL.22.	Some family members ask residents' preference of sun and shade and push them to a desired spot before they leave.
	SL.23.	Staff offer services of bringing sunglasses, water or clothes to the courtyard users.
	SL.24.	Staff offer choice of having outdoor lunch at the courtyard in summer.
	SL.25.	Choice of having outdoor breakfast or dinner in summer is not widely known or encouraged.
	SL.26.	Staff verbally invited residents to participate in an outdoor activity 20 minutes before the event.
	SL.27.	Information regarding flower gardens (e.g., flower names, selection of flowers and replanted flowers) is not shared with residents.

- SL.28. If the weather is too extreme, doors to the courtyard are locked. Staff put a close sign on the doors.
SL.29. No clock is placed at the courtyard to show time.

3. Extension of indoor space

Extension of indoor space (7 rules)		
A place of care/activity programs	SL.30.	The courtyard is used as a place for arm and hand exercises for rehab by a therapist.
	SL.31.	The courtyard is set up for structured activities such as a drawing class or tossing ball.
	SL.32.	Umbrella chair-table sets accommodate family-led or staff-led group gathering.
	SL.33.	Several movable chairs and small coffee table accommodate small group gathering or one-person activity.
Accommodation of activities	SL.34.	Some cushions are provided for comfortable sitting.
	SL.35.	Family members or residents can easily drag chairs and coffee tables to where they like. Umbrella tables are heavy; they remain in the same place.
	SL.36.	In summer, the courtyard has a tent extending from the porch to the center of the patio to add more shade.

4. Unobtrusive surveillance

Unobtrusive surveillance (7 rules)		
Observation from indoor spaces	SL.37.	The courtyard is visible from a main corridor; staff give a quick check while walking through the corridor for work.
	SL.38.	Staff and family members themselves constantly use the courtyard as a shortcut between corridors in summer.
Courtyard as a shortcut	SL.39.	Residents mainly use the courtyard as a shortcut to the activity room, dining room and OT/PT room.
	SL.40.	Ambulance staff push a bed and use the courtyard as a shortcut.
Passersby's greeting	SL.41.	Staff walk through the courtyard and greet residents with offering water, sunglasses, clothes or assistance in movement.
	SL.42.	Some family members who pass through the courtyard greet or offer help to residents.
	SL.43.	Residents who are more independent help watch residents in the courtyard while walking through the place.

5. Things may get easy

Things may get easy (12 rules)		
Free use of furniture and accessories	SL.44.	Family members and residents arranged chairs and coffee tables freely or invent new functions.
	SL.45.	Family members close or open umbrellas based on their need of sun and shade.
	SL.46.	Staff may not put furniture back to where it is supposed to be. People sometime have to find out where it is.
	SL.47.	Family members are allowed to use a grill provided by the facility. Family members have to notice staff beforehand so maintenance staff set up the grill.
	SL.48.	Family members use a water can and hoses provided by the facility to water plants when they feel necessary.
	SL.49.	Personal birdfeeders are allowed; they shall be taken care of by their family members.
Free access	SL.50.	Residents access to the courtyard independently through two wheelchair power doors.
	SL.51.	A geriatric bed is likely to be stuck in cracks of pavements or a threshold.
	SL.52.	Wheelchaired residents deadhead plants grown in containers without bending their

body.

- SL.53. A maneuvering space is preserved in front of container gardens, allowing residents to find a best angle of checking plants.
- SL.54. Residents are unable to physically access to flowers on the ground or in a wheelbarrow.
- SL.55. Wheelchaired residents have no direct access to a bathroom or water dispenser near the courtyard. A request has to be made to staff.

6. People out there

People out there (15 rules)		
Spontaneous socialization	SL.56.	Residents talk with other people spontaneously.
	SL.57.	Flowers, vegetables and weather are major conversation starters.
	SL.58.	Residents walk through the courtyard and greet other people.
	SL.59.	Rambling and repetitive talk are normalized in the courtyard. One resident greets everyone who passes in front of her. The passersby also give feedback.
	SL.60.	Residents go through the courtyard and stop at places where people sit and where plant containers are located.
	SL.61.	A family cookout event invites other residents in the courtyard to join the party and enjoy the food.
	SL.62.	Some family members walk through the courtyard and initiate simple conversation with residents.
	SL.63.	Staff walk through the courtyard and greet residents with offering water, sunglasses, clothes or assistance in movement.
Control of interactions	SL.64.	Residents propel themselves to other people for conversation or ask staff to bring more people outside.
	SL.65.	Individual residents form social group spontaneously.
	SL.66.	Some residents take the initiative in chatting with other people in the courtyard.
Less restriction	SL.67.	It seems acceptable that two toddlers play in the courtyard with sounds of screams.
	SL.68.	Some family members talk and laugh loud.
	SL.69.	In a structured activity, participants are allowed to withdraw, leave, or join the activity halfway. Residents with wandering or “going home” behavior are given positive distraction through interacting with nature and people; they are not forced to continue the activity.
Passing time	SL.70.	Some residents pass the time in the courtyard before going to an activity.

7. Balancing sensory experience

Balancing sensory experience (17 rules)		
Vision, touch and hearing	SL.71.	Most of residents observe people and nature.
	SL.72.	Some family members push residents to check flowers and vegetables.
	SL.73.	Residents who sit at the activity alcove at the main corridor can observe the courtyard easily.
	SL.74.	Some residents touch tomato and pick up chives.
	SL.75.	Activity staff may turn on background music for more than two hours.
Smell and taste	SL.76.	Lilac bushes are grown with intense fragrance in summer.
	SL.77.	Residents are allowed to pick up and taste garden-grown tomatoes. Some residents pick up chives and taste the flavor.
	SL.78.	Residents and family members are allowed to picnic in the courtyard.
	SL.79.	Residents make their lunch delivered to the courtyard. Family members eat lunch at the

		courtyard.
	SL.80.	Staff are to give a cup of water with a lid and straw to residents so the water can be kept clean.
Weather adjustment	SL.81.	There is adequate shady space. Residents who like full shade stay in the tent and umbrella tables. People who like partial shade sit under ash trees.
	SL.82.	Residents sit with one half of their body in the shade and the other half in the sun.
	SL.83.	Residents sit with their face in the shade and back (or feet) in the sun.
	SL.84.	Residents move with the shade or sun.
	SL.85.	Residents stay in the sun and then move to a place with partial shade or full shade.
	SL.86.	When a shady space with a nice angle of observing people is empty, residents fill the spot quickly.
	SL.87.	No residents or family members sit in the porch although it provides full shade.

8. What's new?

What's new (7 rules)		
Exploring things	SL.88.	Some residents know where a best location is to watch birds nesting in the courtyard.
	SL.89.	Some residents are curious about wild flowers and new plants and like to know what they are.
	SL.90.	Vegetables are well-maintained in the courtyard, which provides new things to discover. Some residents move around the courtyard to check chives and tomatoes.
Knowing what happened	SL.91.	When a space with full shade and a nice angle of observing people is empty, residents fill the spot quickly.
	SL.92.	Residents who sit at the activity alcove in the main corridor are able to preview the courtyard before taking an outdoor venture further.
	SL.93.	There are things happened regularly in the courtyard. For example, a volunteer waters plants almost every day. Some residents like to see the routine work.
	SL.94.	Residents exchange information about activity events, the facility, community and country in the courtyard.

9. Discontinuation of past habits

Discontinuation of past habits (6 rules)		
Familiar and active activities	SL.95.	Residents are allowed but not encouraged to do light gardening such as weeding and deadheading. Very few residents engage in the activity.
	SL.96.	Family members or volunteers are allowed to water plants in the courtyard.
	SL.97.	Family members may add a birdfeeder, flower basket or decoration outside of their window.
	SL.98.	Activities related to home gardens such as digging soil, feeding birds with bread, making flower bouquets and processing and sharing food cannot be accommodated in the courtyard.
A not-so-ideal courtyard	SL.99.	Residents are encouraged to express their preference or expectation; however, their ideas may not be translated into staff's practice.
	SL.100.	Residents are allowed to request outdoor breakfast and lunch. However, outdoor lunch rather than breakfast is encouraged.

Appendix O: Rules of Golden Age's Courtyard

1. Not a necessary care component

Not a necessary care component (18 rules)		
Undefined responsibility of maintenance	GA.1.	Responsibility of maintaining the courtyard is not assigned. The director assumes her responsibility is to take care of planting, fundraising and decoration of the courtyard. Maintenance staff take care of built components (e.g., paving), mow the lawn and trim trees based on the administrator's request.
	GA.2.	No one clean up the courtyard. Piles of dead weeds, trash, and gloves are left at the courtyard.
	GA.3.	Residents are allowed to do some light gardening such as watering plants with hoses, weeding and deadheading.
Sporadic care service	GA.4.	Few nursing staff bring medicine and water to residents in the courtyard.
	GA.5.	No water dispenser is placed in the courtyard.
	GA.6.	Staff check residents in the courtyard occasionally. They may offer residents water, radio or assistance in transportation.
	GA.7.	No activity staff invites residents at the courtyard to participate in an on-going indoor activity.
	GA.8.	An activity staff member brings five or more residents back to the building one by one after an activity.
	GA.9.	Activity staff sometime bring residents to the courtyard for sunlight and leave without interacting with other people.
	GA.10.	Very few nursing staff push residents to the courtyard or bring them back to the building. Activity staff take care of transportation mostly.
	GA.11.	A resident practices a new walker under a therapist's supervision.
	GA.12.	A nursing staff member escorts an agitated resident to the courtyard and walks with him. They only stay for few minutes.
Scheduled activity programs	GA.13.	Staff use the courtyard as a place for interviewing residents.
	GA.14.	The courtyard is used for structured activities every two days; the outdoor activities are compatible with both indoor and outdoor space including exercise, reminiscence activities, book reading and ball tossing. It is staff's call to decide where an activity is carried out.
Passive activity	GA.15.	No specific activity is planned using existing natural material in the courtyard.
	GA.16.	Most of residents in the courtyard are either talking to others or observing nature/people.
Marketing	GA.17.	Few residents are allowed to do light gardening with the director's approval.
	GA.18.	The courtyard is introduced in visitors' tours. Led by the administrator; tour groups just look at the courtyard from the dining room without walking around the space.

2. Little control of information

Little control of information (18 rules)		
Levels of visibility	GA.19.	Residents like to stay at the edge of the patio where they can preview the courtyard. However, the spot is too close to a bedroom window. Residents at the inside may feel a lack of privacy. People at the courtyard may feel being observed from the inside.
	GA.20.	Family groups like to stay on the patio under tree shade. The only place that satisfies the need in the afternoon is the space that connects two entries. However, this spot is the center of the courtyard, very visible from indoor and outdoor space.
	GA.21.	No screened or semi-enclosed seats are provided in the courtyard.
	GA.22.	The side patio is less visible space. However, it is out of staff's sight but adjacent to a bedroom

		window; residents at the side patio may feel disconnected with indoor staff but being observed by others.
Flow of personal information	GA.23.	Conversation at the central patio can be easily overheard. People often talk about personal matters and family members' condition.
	GA.24.	Staff are allowed to conduct interviews with residents in the courtyard. However, information is likely to be exposed to public.
Information awareness	GA.25.	Residents like to sit at the edge of the patio where they can overview the courtyard.
	GA.26.	Residents use the dining room as a sun room so they preview the courtyard before take a further venture.
	GA.27.	Residents and staff are unable to receive outdoor information while walking on a hallway; no public space at the inner ring of corridors has windows looking at the courtyard.
	GA.28.	A reminiscence group is arranged at the side patio where residents have no visual connection with familiar indoor environments.
	GA.29.	Outdoor lunch is not prohibited but not encouraged either. No written, verbal or physical cue (i.e., adequate furniture) indicates availability of service regarding delivering meals to the courtyard.
	GA.30.	Staff are not asking resident's preference of sun and shade before positioning them in the courtyard.
	GA.31.	No clear physical cue differentiates paths and sitting areas. People gather at wherever they like.
	GA.32.	Activity staff hardly informs or invites residents at the courtyard regarding coming activities.
	GA.33.	Information about flower gardens (e.g., flower names, selection of flowers and replanted flowers) is not shared with residents.
	GA.34.	No sign indicates open/close of the courtyard.
	GA.35.	No clock indicates time, and no staff remind courtyard users of lunch time.
	GA.36.	An electronic bell is installed on the handrail in front of the power door. Residents may push the bottom to contact indoor staff. However, the bell is too small to discover; not many residents are aware of it.

3. Unobtrusive surveillance

Unobtrusive surveillance (8 rules)		
Observation from indoor space	GA.37.	Activity staff can easily monitor the courtyard from the main dining room/activity room and secondary dining room.
	GA.38.	The courtyard is partially visible from the activity office. Activity staff may glance around the courtyard while doing paper work.
	GA.39.	No public space at the inner ring of corridors has windows looking at the courtyard. Staff are unable give a quick check on their way to work.
Courtyard as a shortcut	GA.40.	Very few staff and family members use the courtyard as a shortcut between corridors.
A quick stop	GA.41.	Most of staff left quickly after bringing residents to the courtyard. They didn't interact with other people or check their needs.
	GA.42.	The only way residents can ask for help is to wait staff to come to the courtyard or ask other mobile residents to help.
	GA.43.	Some nursing staff smoke in the courtyard and talk to residents or bring residents back to the building.
Resident's help	GA.44.	Residents help each other; some residents check if other people need assistance.

4. Things may get easy and difficult

Things may get easy and difficult (18 rules)		
A lack of furniture & shaded patio	GA.45.	The courtyard is poorly furnished. The current furniture and accessories includes several movable plastic chairs, a metal mesh table, one lounge chair, one gas grill, and four ash tray stands. The movable plastic chairs are major furniture used in spontaneous and structured social activities.
	GA.46.	There is no small and movable table to place food, drinks and recreational device.
	GA.47.	No water dispenser or hat/cushion box is provided in the courtyard. Residents have to come inside to get water.
	GA.48.	The central patio is exposed to sun after 9:30 am. There is no shade device so a structured activity is usually carried out on the path or the side patio under the tree shade. Residents are lined along the path or patio. When a resident at the bottom of the raw liked to go inside, it took a lot of effort to create a walkway by moving other residents aside.
	GA.49.	Individual residents also stay at the path under the tree shade in the morning. If staff are going to have a group activity out there, individual residents are asked to leave.
Free use of furniture and accessories	GA.50.	People dragged plastic chairs and ash tray stands to wherever they like in the courtyard. Some ambulatory residents dragged chairs on the lawn under the tree shade.
	GA.51.	The metal round table is heavy; no body uses it. Very few people use the lounge chair.
	GA.52.	Residents used water hoses to water plants with staff's approval and help.
	GA.53.	An electronic bell is installed on the handrail in front of the power door. It allows residents to contact indoor staff.
	GA.54.	Residents are not allowed to use gardening tools like a fan rake due to safety concerns.
Free and easy access to the courtyard	GA.55.	One wheelchair power door allows residents to access the courtyard independently.
	GA.56.	All doors (one power door and one sliding door) are kept unlocked during the day.
	GA.57.	It is difficult to reach wheelchair touch bottom from a wheelchair.
	GA.58.	The glass-panel sliding door to the courtyard is heavy even staff have troubles to push it.
	GA.59.	There is a threshold at the sliding door. Staff have to lift a wheelchair over it when transporting residents to the courtyard.
	GA.60.	Wheelchaired residents are stuck at cracks in front of the power door.
	GA.61.	There is no raised bed in the courtyard so residents bend their body to get rid of weeds
	GA.62.	People who stay on the path for tree shade block the way to the side patio.

5. Familiar faces

Familiar faces (15 rules)		
Spontaneous outdoor visits	GA.63.	Smoker or mobile residents visit the courtyard more regularly.
	GA.64.	Spontaneous conversations between individual residents are found but not very often.
	GA.65.	More family groups visit the courtyard in the afternoon. Family members are not interacting with other residents.
	GA.66.	Staff smoke in the courtyard and talk to residents spontaneously.
	GA.67.	Resident-formed social groups are not common.
Control of interactions	GA.68.	Two to three residents may propel themselves to other people for conversation.
	GA.69.	Family members who like to have more privacy may gather at the side patio or the path.
	GA.70.	No family members imitate a party or picnic in the courtyard.
Less restriction	GA.71.	Resident-led activity (e.g., playing chess or poker) is not formed in the courtyard.
	GA.72.	Residents throw cigarette butts on the ground.
	GA.73.	In an outdoor group activity, family members may sit next to residents in outdoor group activities. Residents could join the game anytime but may not withdraw the game halfway; staff

	preferred all residents leave the courtyard together.
GA.74.	Residents throw bread to the ground for birds. No staff intervene or wipe it away.
GA.75.	Residents may bended their body to do weeding with bared-hands whenever they felt necessary.
GA.76.	Family members and residents may play a game or exercise in the courtyard.
GA.77.	Family members are not allowed to use the grill.

6. Few choices of sensory stimulation

Few choices of sensory stimulation (19 rules)	
Vision, touch & motion	GA.78. Flowers are taken care of to maximize visual appreciation.
	GA.79. Plants are grown on the ground; few of them reach a wheelchair eye level.
	GA.80. Residents are allowed to do light gardening such as watering, weeding and deadheading.
	GA.81. Family members and residents take a walk in the courtyard.
	GA.82. Residents watch birds eating bread they throw.
Smell, taste and auditory	GA.83. Heavy cigarette smell covers up fragrance of flowers and repels non-smokers.
	GA.84. A pond with a water pump and spray may create water sounds but the pump is often turned off due to maintenance issue.
	GA.85. Outdoor lunch in the courtyard is not considered in meal service.
	GA.86. Residents are allowed to bring a cup of coffee from the dining room and sit in the courtyard.
	GA.87. If there is a vegetable garden donated by staff or family members, activity staff will take cares of them and residents are allowed to taste garden-grown food in their meal.
	GA.88. No background music plays in the courtyard. Traffic and mechanic noise is loud enough to get attention.
Weather adjustment	GA.89. Shady areas are inadequate. The courtyard relies on an oak tree to cool environments. After 10:30 there is little building shade. A structured activity is usually carried out on the path or the side patio under the tree shade in the morning. Some areas of the central patio are covered by the tree shade after 2:00pm.
	GA.90. One sixth of the central patio is shaded after 3:00pm. Residents are lined at the edge of the patio under the tree shade by staff.
	GA.91. Family members sit under the tree shade no matter where it is.
	GA.92. Residents are placed on the lawn under the shade for an activity. The uneven lawn causes more staff effort in transportation.
	GA.93. Residents sit with one half of their body in the shade and the other half in the sun on the patio or path.
	GA.94. Residents adjust their position between sun and tree shade areas. They sit with their face in the shade and back (or feet) in the sun.
	GA.95. Residents move with changes of the shade or sun or sit on an area with partial shade.
	GA.96. Some people come to the courtyard for sun tanning.

7. Meaningful and familiar engagement

Meaningful and familiar engagement (9 rules)	
Meaningful participation	GA.97. Residents are allowed to volunteer in setting up activity environments or leading activities.
	GA.98. Some residents help maintaining garden space. A past social role such as a green thumb and greenhouse worker may be enhanced.
	GA.99. Residents are not allowed to use a fan rake to get rid of weeds.
	GA.100. Residents help each other in the courtyard because no staff is around to respond to their need.
Familiar	GA.101. Residents are allowed to save left-over bread to feed wild birds.

activities	GA.102.	Residents talk about flowers and vegetables in the courtyard, and they start reminiscence of life in farms and home gardens.
	GA.103.	Family members and residents play a game or do exercise in the courtyard.
	GA.104.	Residents smoke in the courtyard.
	GA.105.	Residents enjoy the outdoor scene with a cup of coffee.

8. Safety concerns

Safety concerns (13 rules)		
Behavior conflict	GA.106.	No clear physical cue distinguishes paths from gathering areas. People stop and gather at wherever they like.
	GA.107.	Residents who stay on the path for tree shade block the way to the side patio. If there will be a group activity in the morning, the “blockers” are asked to leave.
	GA.108.	Residents are lined at the path for a group activity. If residents who sit at the bottom of the row like to withdraw from the activity, they are usually asked to stay because staff had to either move the line to create pass space or push the withdrew residents on grass (or let them walk on grass). Either way delayed the activity and took more staff effort in transportation.
Neglect	GA.109.	Staff bring residents to the courtyard without asking their preference of sun and shade. Some staff remember to give residents a cup of water and some do not.
	GA.110.	No staff check residents who stay at the courtyard over two or three hours in summer.
	GA.111.	When residents ask for help, no staff is around or aware of their request.
	GA.112.	Maintenance staff do not clean the courtyard regularly.
Physical hazards	GA.113.	Maintenance staff are aware of the cracks of pavement but take no action in improving environments due to budget shortage.
	GA.114.	Plastic chairs are not sturdy and have caused fall.
	GA.115.	Residents are easily stuck at the cracks in front of the power door.
	GA.116.	No raised bed is provided for wheelchair gardening. Residents have to bend their body to do weeding.
	GA.117.	Cigarette butts are randomly thrown on the ground, which could start fire easily.
	GA.118.	Staff have to lift wheelchairs over the threshold at the sliding door. Both staff and residents may get hurt.

9. Showing some personalities

Showing some personalities (6 rules)		
Being on my way	GA.119.	Residents were not encouraged to decorate the courtyard or ornament windows by adding flowers baskets or birdhouses.
	GA.120.	Residents are allowed to throw leftover bread to the ground or do weeding spontaneously.
	GA.121.	Residents are allowed to put their own chair in the courtyard.
	GA.122.	Residents may not withdraw from outdoor activities easily; staff preferred consistent behavior among residents in terms of coming and leaving.
	GA.123.	Resident’s preference of thermal-comfort levels was not inquired; staff positioned them in the sun or shade based on their own judgement.
	GA.124.	When residents ask for help in the courtyard, no staff is around to respond to their request.

Appendix P: Rules of Elderly Living's Courtyard

1. Out of care-delivery area

Out-of-care delivery area (10 rules)		
Staff-based maintenance	EL.1.	Staff are to clean the courtyard every day. However, it is easy to find towels, foam cups or lids are left on the ground or a mug is left on a table for several days.
	EL.2.	Maintenance staff are to take care of built components (e.g., paving) and trim trees.
	EL.3.	The administrator and maintenance staff are to supervise the courtyard. The supervision is not well carried out. A small grill that is not allowed in the courtyard was placed under the tree for a long time.
	EL.4.	Staff are to water plant and other plant-related tasks. Residents and family members are not encouraged to do light gardening.
Sporadic care service	EL.5.	Nursing or activity staff are to bring residents back to their room when they need to take medicine or wash up.
	EL.6.	Staff are to place a water dispenser in the morning every day. No staff check whether the water dispenser is empty or not during the day.
	EL.7.	Staff are to bring residents to the dining room if they are late for the meals. Sometimes no staff look for residents at the courtyard after lunch has been served for 15 to 30 minutes.
	EL.8.	Staff are to check residents in the courtyard every hour. However, some residents are left at the courtyard for more than two hours without staff's visit.
Passive activity	EL.9.	Activity staff rarely ask residents at the courtyard to see if they like to participate in an on-going indoor activity.
	EL.10.	Residents are expected to engage in sedative activities. Most of residents in the courtyard are either talking to others or observing nature/people.

2. Little control of information

Little control of information (19 rules)		
Levels of visibility	EL.11.	The central and entrance patio are very visible. People who sit there are not free from being observed by the public.
	EL.12.	People drag chairs and sit at the edge of the entrance patio or corners of the central patio.
	EL.13.	Seats in the pergola are screened by lattice panels with climbing vines.
Flow of personal information	EL.14.	The pergola is located away from the mainstream walkway. Conversation is kept in that semi-enclosed room.
	EL.15.	The pergola is usually occupied by a family group. When all seats are taken in the courtyard, two different groups may squeeze into the pergola.
	EL.16.	Conversation at the central patio can be easily overheard. People talk about personal matters, family issues and complaint of the facility.
Information awareness	EL.17.	The entrance patio allows residents to preview the courtyard before taking an outdoor trip.
	EL.18.	Residents stay at the entrance patio for few minutes to see if it is too hot or too cold. If they feel uncomfortable with the weather, they just go inside immediately.
	EL.19.	Residents observe the courtyard and receive outdoor information at the resident lounge/sun room without going outside.
	EL.20.	Outdoor lunch is not prohibited but not encouraged either. No written, verbal or physical cue (i.e., adequate furniture) indicates availability of service regarding delivery meals to the courtyard.
	EL.21.	Staff are not asking resident's preference of sun and shade before positioning them in the

		courtyard.
EL.22.	No clear physical cue differentiates paths from sitting areas in the central patio. Behavior conflict is created between wanderers who pass the patio and family members who gather at the patio.	
EL.23.	No clear physical cue distinguishes walkways from sitting areas. People sometime stop and gather at path intersections.	
EL.24.	A wheelchaired wanderer seems not aware of the existence or a power door. No sign indicates location of it. He only uses swing doors.	
EL.25.	Activity staff rarely informs residents at the courtyard regarding on-going or coming activities.	
EL.26.	Information regarding flower gardens (e.g., flower names, selection of flowers and replanted flowers) is not shared with residents.	
EL.27.	Although there is a water dispenser at the courtyard, some residents do not know how to operate the faucet.	
EL.28.	Although hats/cushions are provided in the courtyard, they are kept in a storage box without signage or labels indicating its contents.	
EL.29.	A small grill is placed in the courtyard for a long time. Although a family cookout is prohibited in the courtyard, the grills may confuse rather than clarify the policy.	

3. Extension of indoor space

Extension of indoor space (13 rules)		
A place for care/activity programs	EL.30.	The courtyard is used as a place for rehab practice by therapists.
	EL.31.	The central patio is set up for structured activities such as ball tossing.
Accommodation of activities	EL.32.	No furniture is placed at the entrance patio. Family members who like to sit at the patio drag a chair from other places; some people just sit on the floor or put drinks on the floor.
	EL.33.	The central patio is furnished with seven movable chairs, one round table and one coffee table to meet needs of different social groups.
	EL.34.	Individual users drag a chair and coffee table to a corner.
	EL.35.	A structured activity is usually carried at the central patio. Ten to 15 people are arranged in a circle at one side of the raised bed, which often blocks the entry of the patio.
	EL.36.	The iron mesh round table is movable but heavy. When family members picnic in the courtyard, they usually gather at the iron mesh round table.
	EL.37.	Residents in the central patio stay next to the raised bed so they can put their drinks on the top of it.
	EL.38.	A water dispenser on a cart is usually pushed to the central patio in the morning.
	EL.39.	There are always cushions on the benches of the pergola. Cushions for other chairs are kept in an unlocked storage box on the entrance patio.
	EL.40.	The pergola is usually occupied by a family group with two to three family members and one wheelchaired resident. It seems crowded if two wheelchair users are placed in the pergola at the same time.
	EL.41.	Furniture takes most of the space of the pergola. It is too crowded if two wheelchair users stay in there at the same time.
	EL.42.	Individual residents may use the pergola for contemplation but not very often.

4. Limited surveillance resources

Limited surveillance resources (8 rules)		
Observation from indoor spaces	EL.43.	The courtyard is not visible from corridors and activity offices; staff are less likely to give a quick check while walking through hallways or carrying out a task.
	EL.44.	The courtyard is visible from the dining room. Kitchen staff observe the courtyard and help bring residents inside or outside. They also check residents and move residents to the sun or shade. However, there is not always staff around in the dining room; surveillance is not made on a regular basis.
	EL.45.	The courtyard is partially visible from a resident lounge and nursing station. Staff may monitor some parts of the courtyard from the inside.
	EL.46.	Residents who stay at the entrance patio can easily get staff attention. The entrance patio is adjacent to the power door which the majority of staff, residents and visitors will use. It is also visible from a nursing station.
Being inconvenient to drop by	EL.47.	Very few staff and family members use the courtyard as a shortcut between corridors.
A quick stop	EL.48.	Most of nursing staff left quickly after bringing residents to the courtyard. They didn't interact with other residents or check their needs.
	EL.51.	Very few staff take a short break in the courtyard and talk to residents and family members.

5. Things may get easy and difficult

Things may get easy and difficult (15 rules)		
Free use of furniture and accessories	EL.52.	Family members and residents arrange furniture or invent a new function for better social interaction. For example, a coffee table is used as a foot stool or chair.
	EL.53.	Family members dragged chairs to wherever they like in the courtyard.
	EL.54.	A water dispenser is placed at the courtyard every morning. It sits on a cart with clean foam cups, lids and straw. Anyone in the courtyard has free access to it.
	EL.55.	Family members are not encouraged to use a water can and hoses to water plants.
Free and easy access	EL.56.	One wheelchair power door allows residents to access the courtyard independently.
	EL.57.	All doors (one power door and four swing doors) are kept unlocked during the day.
	EL.58.	The wheelchair touch bottom for the power door is installed on the left side of the door (the left side facing the door). It facilitates left-handed individuals to go inside while right handed wheelchair residents may have to make a U-turn after pushing the bottom.
	EL.59.	If residents have difficulty in pushing wheelchair bottom, indoor staff may come out to help residents get in the building.
	EL.60.	The doors from the dining room to the courtyard are swing doors. Some residents like to use the door to the courtyard. However, they often have problems to pull the door while propelling themselves on a wheelchair.
	EL.61.	Wheelchaired residents are stuck at cracks in front of the exit to the dining room and at the entries of the central patio.
	EL.62.	The raised bed at the central patio allows wheelchaired residents to check plants or do deadheading without bending their body.
	EL.63.	Residents may have to bend their body to check flower boxes placed along the paths.
	EL.64.	The one-level figure-8 shaped loop allows residents to return to where they start.
	EL.65.	Residents tried to get water from the dispenser but failed. They are unable to move closer to the dispenser and push the faucet by themselves.
	EL.66.	The hat/cushion box is too low to be reached by wheelchaired residents.

6. People crowding in shady spots

People crowding in shady spots (14 rules)		
Spontaneous socialization	EL.67.	The majority of people gather at the central patio or entrance patio under tree shade. Spontaneous conversation is easily triggered or forced to be public.
	EL.68.	Individual residents form a social group at an intersection of two paths.
	EL.69.	Courtyard flowers and the weather are a major topic of random conversation.
	EL.70.	Residents and family members watch staff watering plants and start talking to staff.
	EL.71.	Family members greet with other residents while walking on the path to find shady spots.
	EL.72.	When activity staff bring residents to the courtyard, they greet residents and offer water, sunglasses, clothes or assistance in movement.
Control of interactions	EL.73.	Residents propel themselves to other people for conversation.
	EL.74.	The X-shaped raised bed divides the central patio into four different areas. It helps family groups to create their own social space.
	EL.75.	The pergola gives a sense of enclosure. People in there may feel less obligation to interact with other people.
	EL.76.	Some residents initiate conversation using flowers and birds as conversation starters.
	EL.77.	Chairs are dragged to where shade is.
Less restriction	EL.78.	Two toddlers scream and play in the courtyard.
	EL.79.	Some family members talk and laugh loud. They play instruments and sing in the pergola.
	EL.80.	Family members bring a dog to the courtyard. Residents play with it.

7. An uninteresting place

An uninteresting place (22 rules)		
Vision, touch & motion	EL.81.	Beautiful tree shade falls on the ground, creating an interesting visual effect.
	EL.82.	Flowers on the ground, flower boxes, and raised bed are just for observation; Residents are not encouraged to do light gardening such as weeding and deadheading. One resident did deadheading quietly.
	EL.83.	Most of residents observe people and nature in the courtyard.
	EL.84.	Family members and residents stroll on the path and check flowers.
	EL.85.	Residents watch birds eating food on a bird feeder stand.
	EL.86.	When family members bring a dog to the courtyard, it gets residents' attention and triggers conversation.
Smell, taste and auditory	EL.87.	No flowers with fragrance are planted, and no vegetables or herb are grown to trigger taste experience.
	EL.88.	No background music plays in the courtyard. Traffic and mechanic noise is loud enough to get attention.
	EL.89.	Residents and family members are allowed to picnic in the courtyard.
	EL.90.	Residents are not encouraged to have lunch at the courtyard; no one has lunch at the courtyard.
	EL.91.	Some residents are allowed to bring a cup of coffee from the kitchen and sit in the courtyard.
	EL.92.	Many residents take a nap in the courtyard.

Weather adjustment	EL.93.	Shady areas are inadequate. The courtyard mostly relies on crabapple trees to cool environments. However, tree shade is reduced and falls on walkways or lawn areas after 11:00am; people drag chairs to a shady spot no matter where it is.
	EL.94.	Residents sit with one half of their body in the shade and the other half in the sun.
	EL.95.	Residents adjust their position between sun and tree shade areas. They sit with their face in the shade and back (or feet) in the sun.
	EL.96.	Residents move with changes of shade or sun.
	EL.97.	Family members sit under the tree shade no matter where it is.
	EL.98.	Some people come to the courtyard for sun tanning. They stay in the sun for 10 minutes and go inside.
	EL.99.	The entrance patio has building shade in the early morning. It is usually occupied by people who have no desire to venture further into the courtyard.
	EL.100.	The two patios are fully shaded after 3:30 pm. Over half of the courtyard is shaded after 5:30pm. Some residents come to the courtyard for sun after dinner.
	EL.101.	Residents who are pushed by staff to the courtyard have trouble to adjust orientation and position to changes of sun and shade.
	EL.102.	A structured activity with 10 to 15 persons is usually carried at the central patio. However, the patio is hardly shaded around noon. Some residents withdraw because of the heat.

8. Safety concerns

Safety concerns (12 rules)		
Behavior conflict	EL.103.	No clear physical cue distinguishes paths from gathering areas. People sometime stop and gather at path intersections because it feels like a small patio. Behavior conflict is created between people who walk the paths and who stop at the junction.
	EL.104.	No physical cue such as paving patterns defines social areas in the central patio. Family members drag chairs to wherever they like, and wheelchaired residents stop where tree shade is. They may block two entries of the central patio. Behavior conflict is created between wanderers who like to pass though the patio and people who gather at the patio.
Neglect	EL.105.	Staff bring residents to the courtyard without asking their preference of sun and shade. Some staff remember to give residents a cup of water and some do not.
	EL.106.	No staff inquire residents' needs regularly in terms of water, hat, clothes and going to the bathroom even if the temperature is over 90°F.
	EL.107.	Staff supposed to place a water dispenser in the morning but sometime it is brought to the courtyard until the early afternoon. No staff check whether the water dispenser is empty during the day.
	EL.108.	When residents ask for help, no staff is around or aware of their request. No emergency communication device is installed in the courtyard to allow residents to contact indoor staff.
	EL.109.	Maintenance staff do not clean the courtyard regularly. The wanderer sometime drinks water people left on the table.
Physical hazards	EL.110.	Some residents are stuck at the cracks at the entries of the central patio and in front of the doors to the dining room.
	EL.111.	Although smoking is prohibited, some family members smoke in the courtyard.

9. Low freedom of choice

Low freedom of choice (9 rules)		
Familiar activities	EL.112.	A resident's bird feeder is placed by a resident's request and with the administrator's approval. Residents watch bird eating food from the central patio.
	EL.113.	Family members and residents are not allowed to use hoses or a watering can to water plants. Residents are not encouraged to do light gardening.
	EL.114.	Family members and residents stroll on the path and observe the surroundings.
	EL.115.	Flowers in the courtyard trigger reminiscence. Family members talk about how they plant tomatoes in their home garden.
	EL.116.	Residents are not encouraged to have outdoor lunch.
Being on my way	EL.117.	A resident has a different opinion with the administrator regarding orientation of a bird feeder stand. When it is turned to a certain direction by staff, the resident will turn it back.
	EL.118.	Staff are not asking resident's preference of sun and shade; they position residents based on their own judgement.
	EL.119.	All decoration of the courtyard is made by staff.
	EL.120.	When all shaded seats are occupied, people who cannot find a shady spot just go inside.

Appendix Q: Theories of Environmental Perception and Cognition

Shaping Research on Institutional Outdoor Environments

1. Environmental Perception

Environmental perception is a psychological process, in which people comprehend physical environments through sensory reactions to environmental stimuli (Holahan, 1982). According to Holahan (1982), traditional research on perception is to understand how people perceive isolated objects but contemporary approaches are developed to deal with molar environments. Three major approaches include 1) psychophysiological approach; 2) ecological approach and 3) Gestaltian approach (Lang, 1987; Holahan, 1982) (Figure Q-1); they guides most of the stimulating-based studies of institutional outdoor environments.

1) Psychophysiological approach on perception

A leading theorist of the psychophysiological approach is Berlyne (1960), who is interested in relationships between environmental stimulation and arousal. His work shaped Wohlwill's research on environmental assessment and adaptive behavior (Wohlwill, 1966, 1974, 1976; 1983). Wohlwill on the contrary recognized more involvement of cognitive processes —learning and memory—in interactions with environments. Their work underpinned Ulrich's (1983) research on natural environments in stress

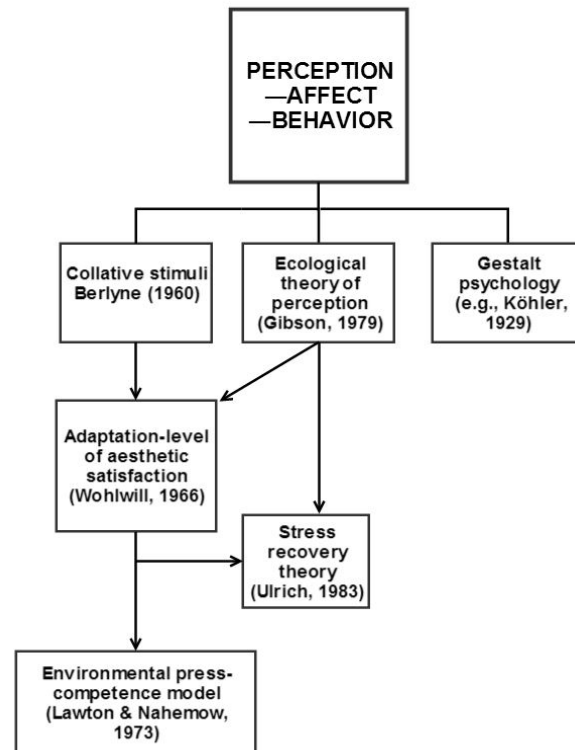


Figure Q-1. Key theorists related to environmental perception

reduction; however, Ulrich did not continue Wohlwill's efforts to explore complexity of cognition and perception in environmental aesthetics but leaned to a more neuropsychological approach framed by Zajonc (Zajonc, 1980).

Wohlwill central concept was fully developed by Lawton and Nahemow in their "Competence-Press Model" (Lawton & Nahemow, 1973). The model integrated Wohlwill's idea of "adaptation level" with Lewin's ecological equation $B \text{ (behavior)} = f(P \text{ (person)}, E \text{ (environment)})$ and illustrated a conceptually evaluative relationships between individual competence and environment stimulus. The Competence-Press Model is viewed as a "landmark" theory in gerontology (Wahl & Weisman, 2003) and continues to have a great influence on research and practice of cross-disciplines (nursing, psychology, environmental psychology and gerontology).

Among these scholars, only Lawton and Nahemow explored multiple dimensions of environments (physical, personal, aggregated and social) and articulated characteristics of physical environments, which have been missing in discussion of most of environmental perception theorists. Their model embraces both cognitive and perceptual processes, showing a more holistic and inclusive framework of P-E relationships. Comparison between these scholars is listed in Table Q-1.

Table Q-1. Comparison of major theoretical models of environmental perception

	Berlyne	Wohlwill	Ulrich	Lawton & Nahemow
Personal environments				
Cognitive processes of organization	○	◐	○	●
Sensory experience/ Stimulus information	●	●	●	●
Stimulus energy	○	○	○	○
Emotion/Affect	●	●	●	●
Neural reaction	●	◐	●	○
Activity/Movement	●	●	◐	●
Place identity	○	○	○	○
Meaning/Significance	○	○	○	○
Memory/ Past experience	◐	◐	○	●
Learning	◐	●	○	○
Evaluation	◐	●	◐	●
Physical (objective) environments				
Physical (objective) environments	◐	◐	◐	●
Social relations	○	◐	○	●
Socially agreed-upon/aggregated environments	○	◐	○	●
● Full emphasis; ◐ Some emphasis; ◑ partial emphasis; ○ irrelevant				

▪ *Berlyne's concept of collative stimuli*

Berlyne (Berlyne, 1960, 1971) sees human as information-processing organism, and assumes an inherent ability to compare and collate information from environments and from previous experience. He found some properties of environments including novelty, surprisingness, incongruity and complexity can easily trigger collation processes and change arousal levels; these properties are termed as “collative properties of stimuli”. He described, “arousal can be raised by such properties of stimulus patterns as novelty, surprisingness, complexity, ambiguity, and puzzlingness...to decide how novel, surprising, complex, and so on, a pattern is, one must compare or collate information from a matter of noting relations of similarity or dissimilarity between something that is present now and something that has been encountered in the past.” (Berlyne, 1971, p. 69) The comparison or collation denotes a process of evaluation, in which people assess incongruity between expected and present information.

Berlyne further argued that changes in arousal (caused by collative stimuli) are associated with hedonic reaction, and suggested a mathematical-based relationship between the two—an inverted

“Wundt curve” (Berlyne, 1961, p. 89)— to explain a phenomenon that a relatively moderate level of stimuli with a moderate level of arousal processes a greatest positive hedonic value (Bornstein, 1984); according to Berlyne, positive hedonic value is related to positive feedback, rewarding, pleasure, and incentive motivation that guides approach behavior; its mechanism is controlled by the brain in its reward and aversion system.

From Berlyne’s perspective, immediate approach or withdrawal behavior is toward adaptive status of arousal. For example, when people feel hungry, they seek food. On the other hand, behavior involved with a last changing is a part of learning; people “learned to approach sources of rewarding stimulation and to withdraw from objects if contact with them has had punishing consequences.” (Berlyne, 1971, p. 78) In either of the situations, to Berlyne, human action is evoked by stimuli or information that reaches the sense organs and excites the brain.

▪ ***Wohlwill’s adaptation level of aesthetic satisfaction***

Wohlwill conceptualized environments as composition of collative properties of stimuli; he viewed the hedonic value corresponding to changes in arousal as indicators of human’s aesthetic satisfaction (preference) with

environments. Different from Berlyne, Wohlwill adapted Helson’s a nutshell diagram (Figure Q-2Figure)(Helson, 1964, cited in Wohlwill, 1966) instead of the inverted Wundt curve to

describe relationships between arousal changes and hedonic values. A major

theme derived from the diagram is related to a concept of an adaption and optimal level of simulation.

Wohlwill described, “for any specified dimension of stimulus variation the individual establishes an AL

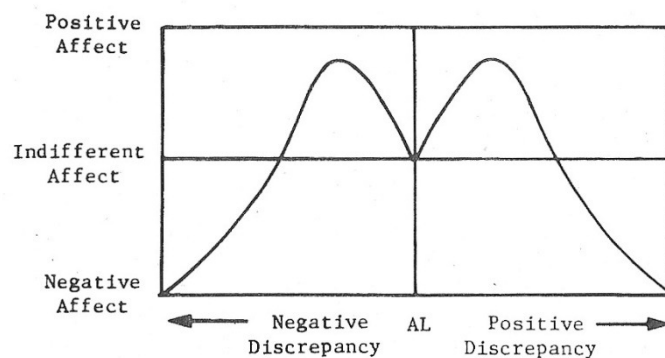


Figure Q-2. Affective response and discrepancy from adaptation level. Reprinted from Wohlwill (1966, p. 35)

(adaptation-level) which determines his judgmental or evaluative response to a given stimulus located on that dimension...the principle is that deviations from the AL in either direction are evaluated positively within a certain range, while beyond these boundaries they are experienced as unpleasant.” (1966, p. 34) According to Wohlwill (1974), the adaptation level is a state experienced by people who receive some kind of stimulation in the short past; people begin to feel difference in terms of positive or negative affect when a property of stimulus (e.g., intensity or complexity) increases or decreases. An optimal level of stimulation means a degree of stimulation (usually an intermediate level) is perceived as the most pleasant and satisfying.

Wohlwill (1983) used the diagram to explaining difference of aesthetic responses to natural and human-made environments; he argued that human prefers nature than non-nature because visual stimulus of nature inherently produces an intermediate level of complexity, and leads to experience of pleasure. The idea that complexity as a determinant of preference is built on his early study (Wohlwill, 1968), in which he found a maximum of preference is reached at an intermediate level of complexity (a curvilinear relationship) among seven pairs of pictures of natural and human-made environments. However, parts of his findings are mixed and need to be interpreted; for example, it is unable to explain why participants gave a lowest preference to an urban picture whose complexity is adjacent to the intermediate level. Different results regarding complexity were provided by Kaplan and his colleagues (Kaplan et al., 1972); they conducted a similar study and found complexity and preference are significantly correlated in both natural and urban sets of pictures; however, data showed that “complexity cannot account for the *difference* in preference values between nature scenes and urban scenes...” (p. 355). From their perspective, content matters and confounds results; they argued it is picture content (natural or non-natural scenes) highly influence the preference rating.

Compared with Berlyne, Wohlwill made a significant step of broadening understanding of environmental satisfaction. Some of Wohlwill’s studies (Wohlwill, 1974, 1976; 1973; Wohlwill & Kohn,

1973) suggested that cognitive processes (e.g., retrieval of memory, utilization of knowledge, skill performance) may intervene in aesthetic responses to environments; For example, people's ability or training of modifying stimulus to which they are exposed may shape how people feel about a new place. Also, locations of previous residence (in terms of levels of pollution, noise, crowdedness, leisure opportunities, crime rate etc.) may influence whether a new place is preferred. Since one's adaptation level serves as important reference point of environmental satisfaction, preference of environments is thus multiple-faceted, including biological, psychological and social dimensions of people. The notion is highlighted in Wohlwill's example of vacationer's choice of a big city or a resort (1966) as well as study of migrants' environmental satisfaction (one group from metropolitan areas and the other from rural areas) (1974).

Wohlwill's inclusive perspective allows him to discuss real-world issues (e.g., crowding) attributed to environmental stimulation. Wohlwill (1974) argued when stimuli exceed "the limits of tolerance for that individual" in either increasing or decreasing amount of stimulation, environments become stressors evoking negative affect and behavior; examples of environmental stressors include deprivation of sensory stimulation, isolation (a lack of social interaction), confinement (deprivation or restriction of movement), sensory overload, and crowding; these are common issues Wohlwill found in institutional settings and urban environments. He then brought these problems in discussion of "cost of adaptation" (i.e., price of being exposed to these stressors over an extended period of time)(Wohlwill, 1974, p. 141), and called for attention on behavior and cognitive levels of price related to people's little control over stimulation from physical environments (cf., "psychic cost of adaptation" in Glass, Singer and Friedman,(1969)).

- ***Ulrich' Stress Recovery Theory***

Some of Wohlwill's followers continue his approach, recognizing roles of cognitive factors in human interactions with environments (e.g.,Heft, 1998; Nasar, 1989) and other (e.g., Ulrich, 1983) went

on the opposite way. Ulrich's stress recovery theory is based on a neural foundation of aesthetic appreciation, suggesting there is little cognitive intervention in visually-elicited affective responses toward natural environments. Ulrich's theoretical assumption can be traced back to Berlyne's neurophysiological mechanism as well as Zajonc's research on preferenda (Zajonc, 1980, cited in Ulrich, 1983). Preferenda refers to a collection of environmental stimulation allowing people to make a very quick affective evaluation and leading to approach or withdrawal behavior (Ulrich, 1991); according to Ulrich, it includes objects in natural environments like water and visual stimulation such as complexity, structure properties (e.g., order or disorder), focality, depth, ground surface texture, threat/tension, deflected vistas (Ulrich, 1983). People prefer natural environments because nature is characterized by preferenda triggering nervous system, inducing changes in physiological arousal and producing positive affective responses. Evidence to support such argument is derived from measurement of improved physiological responses (e.g., blood pressure, heart rate), which indicates a degree of stress reduction.

Although Ulrich is influenced by Berlyne and Wohlwill, some crucial theoretical differences are worth recognizing in his theory. For example, concepts of inverted Wundt curve between hedonic values and arousal (Berlyne, 1961) or concepts of adaptation and optimal level of stimulation (Wohlwill, 1966) is not emphasized in Ulrich's research. Besides, Ulrich argued that "affects can occur with little information and without precise recognition" (p89) and refused roles of "learning", "memory" or "knowledge" in aesthetic experience of nature. On the contrary, Berlyne did not deny "learning" and "memory" in aesthetic behavior; he expressed, "The human being is an organism whose abilities for storing large amounts of information efficiently, for letting stored information join with the perception of the moment in determining behavior...The human nervous system depends so much on learning, and benefits so much from learning...opportunities to learn mean opportunities to encounter new combinations of stimuli in conditions that act on the arousal system" (p. 295). Wohlwill (1988) is interested in children's perceptual and cognitive learning in particular. His gave a great amount of

research efforts on experiment studies to prove learning influences child's evaluation and interactions with environments and vice versa (Wohlwill & Heft, 1987).

Ulrich's approach made a clear distinction from Berlyne and Wohlwill. However, his assumption disallows him to answer some questions such as "what guides perception?" and "what leads people to see the worlds?"

▪ ***Lawton's Press-Competence Model***

Wohlwill's concepts are fully developed by Lawton and Nahemow in their Competence-Press Model (Lawton and Nahemow's 1973) (Figure Q-3). The model suggests that behavior or affect is the results of interactions between "the competence of the individual and the environmental press of the situation." (Lawton, 1982, p. 43) In this model, an adaptation and optional level is conceptualized, and descriptions of environments and individuals are beyond abstract properties (e.g., texture, complexity). More specifically, Lawton classified environments into physical, personal, small-group, suprapersonal and social environments, each of which has distinct attributes.

- ***Physical environment:***
 - Objective: what can be counted, measured in centimeters, grams or seconds or consensually evaluated.
 - Subjective: personally ascribed meaning, salience, or evaluation of the objective environment
- ***Personal environment:***
 - One-on-one relationships; friends, family, and support networks.
- ***Small-group environment:***
 - The dynamics that determine the mutual relationships among people in a small group in which all members have some one-on-one relationship or interaction
- ***Suprapersonal environment:***
 - Modal characteristics of people in geographic proximity to the subject (as in social area analysis)
- ***Social (megasocial) environment:***
 - Organizational character, social norms, cultural values, legal system, regulations, political ideology, and psychosocial milieu

The classification suggests that Lawton embraced various dimensions of environments that have potential for different psychological processes

(e.g., perception, cognition, and meaning). Each of the dimensions is associated with particular environmental press or force, which is perceived by people as a demand or supporter.

Environmental press is “neutral, in that its positive or negative quality is defined by the interacting individual, rather than residing intrinsically in the environment” (Lawton &

Nahemow, 1973, p. 659). In addition, environmental press fluctuates because people’s

competence changes; its “positive or negative quality, in terms of eliciting adaptive or nonadaptive behavior, can be determined only by knowledge of the competence of the individual.” (Lawton 1982, p. 42) When the press is perceived as negative, it becomes “environmental stressors” (Wohlwill, 1974), which suggests extreme incongruity between people’s adaptation level and external stimulation.

Individual’s competence is described as “relatively stable capacities of biological health, sensory and motor skills, cognitive function and ego strength” (Lawton, 1999b, p. 92); they are measurable variables (e.g., lab tests of biological functions or vision, audition, kinesthesia, and intelligence tests) defining one’s skill in performing tasks of everyday life. Fluctuation of competence may result from illness and physical injury; once it fluctuates, based on the model, experience of environments may change. One advantage of Lawton’s description of personal variables is to allow caregivers to sketch individuals’ adaptation level and coping with environmental stress. For example, an injured person may have a relatively low adaptation level due to bodily pain and mental distress; she may have a reduced

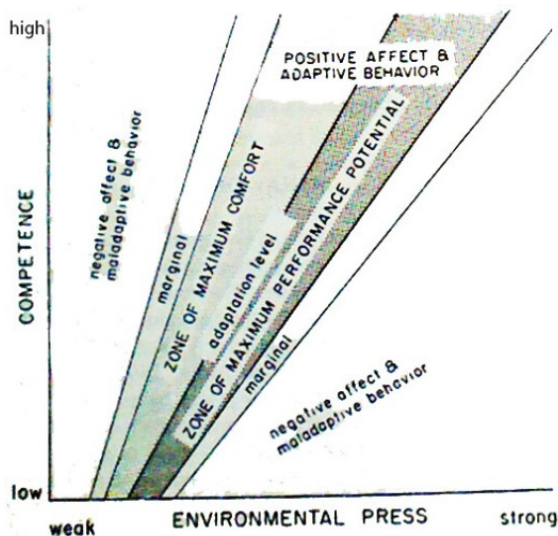


Figure Q-3. Competence-Press Model. Reprinted from Lawton (1982, p. 46)

ability in regulating stimulation or overcoming stressors (e.g., noise, temperature). Based on the model, her zone of negative affect or maladaptive behavior becomes wider; the person can easily experience stress in a given environmental stimulation.

The model reflects several Wolhwill's concepts. For example, people experience neutral affect when environmental press matches their competence (adaptation level). Positive affect and adaptive behavior result from small incongruity between competence and environmental press; negative affect and maladaptive behavior is caused by extreme mismatch between competence and press, suggesting large discrepancy from adaptation level (i.e., hypo-and hyperstimulation (Wolhwill, 1973)). Maximum comfort and performance potential is triggered by an optimal level of stimulation.

According to this model, older adults with good physical and psychological health are more likely to have positive environmental evaluation and efficient performance than those with more health issues. Lower competence suggests a narrower discrepancy from adaptation level that can be experienced as pleasant or desirable. In nursing home settings, walking to a courtyard independently may represent a physical and cognitive exercise (an optimal increase of press) for residents with high competence; the activity allows them to perform the task in maximal potential. However, the exercise may impose too much press and create negative affects to residents with cognitive impairment and mobility limitation; to reach maximum comfort and adaptive behavior, they require staff assistance or prosthetic environments (e.g., signs and automatic doors) to lower environmental press.

Issues of over-or under-stimulation have been found in caring processes in nursing homes (e.g., bathing, feeding, activity participation) (Kovach, 2000; Kovach & Magliocco, 1998); environments often demand too much or press too little on residents with lower competence; they suffer from a wide range of negative affect and maladaptive behavior and have no resource or skill to make adjustment (Wolhwill, 1973). Many environmental interventions based on the model are designed to avoid large discrepancy

from adaptive levels. For example, scheduled group activities are provided to increase cognitive stimulation, sensory stimulation and social interaction without stress (Calkins, 2004; Gitlin et al., 2009).

2) Ecological approach on environmental perception

The psychophysiological approach is built on a fundamental premise that environmental information requires being processed. The premise is challenged by James Gibson, who developed an ecological perspective of environmental perception, arguing that the information already exists in the environments, and human can perceive it directly without particular processes; observer perceives simply by “picking up” information (Neisser, 1976). More specifically, Gibson found when the world is illuminated, information is conveyed through structure of light rays specific to objects and faces or layout of environments (Lang, 1987); when people start to observe from a particular point, observers capture the structure (i.e., texture, gradient, patterns) with optical arrangement. “The structure specifies those objects; the information about them is in the light.” (Neisser, 1976, p. 18) The structure changes when people move; therefore, to perceive more or finer details of environments, people have to move their bodies (Mark et al., 2013). The structure of world is thus dynamics; Lang (1987) described the dynamics and explained, “Even when one is standing on a flat plain, the horizon “cuts off” the world. The actual part that is hidden changes as the point of observation changes. When a person moves through the environment, one vista after another is seen.” (p. 90) The exploration or movement is guided by “affordance” —functional properties of physical environments— toward adaptive behavior (Neisser, 1990). It refers to a particular relationship between potential actions and value or meaning (invariants) of a place, object and event (Gibson, 1994); perception of affordance is innate; for example, a place on which we sit has sit-able qualities that can be detected.

Gibson’s work influences Wohlwill and Ulrich. His concept of affordance underpins parts of Wohlwill’s later research on differentiation between nature and non-nature. According to Wohlwill (1983), artificial worlds are often characterized by rectilinear patterns, abrupt transitions and regular

textures; they produce different perception of affordance from natural environments that usually comprise curvilinear, gradual transitions and irregular patterns. In other words, nature has its unique visual structure and suggests a particular action for adaptation; from Wohlwill's perspective, it may aid in understanding why human responds differently (exploratory behavior and affective responses) to nature and non-nature.

Affordance of natural environments is linked with a concept of preferenda by Ulrich (1983). Ulrich argued human can quickly recognize invariant properties related to survival without learning and cognitive intervention, for example, ground with smooth texture (less depth) afford dwelling and food-seeking. From his perspective, environments with such quality can be easily perceived with eliciting positive affect.

3) Gestalt theory of environmental perception

Opposite to the reductionist position imposed by the psychophysiological approach, Gestalt psychologists argued that human perception is a holistic process; when human perceives a single element, its relationships with other elements will determine how people behave and describe it (Holahan, 1982). In other words, environmental perception is associated with patterns or configuration of stimuli, in which a set of elements ready to be grouped by the human mind (Holahan, 1982); Gestalt psychologists argued that the brains tend to be attracted by certain relationships or forms of organizations that show "goodness of configuration" (Koffka, 1935, cited in Berlyne, 1971, p 16). The tendencies are governed by "laws of pragnanz" including laws of proximity, similarity, continuity, closure and symmetry (Lang, 1987); these laws can be seen as consensus of subjective descriptions of visual stimulation among different individuals; they are fundamental in how the world is perceived. To conclude, psychological experience from Gestaltian perspectives is related to total context and forms of organization because human recognizes the world as whole rather than the sum of its parts (Friedenberg & Silverman, 2011)

The approach that addresses self-organizing tendencies is applied to understanding learning (Reeves, 1996); Gestalt psychologists assume human has ability to discover; discovery is related to a conscious mechanism to organize information received from external environments, and to solve problems. Through discovery, people get new insight and new experience of reorganization of information, and it is the process called learning.

Gestalt psychology has influenced much of later studies on environmental cognition. For example, Lynch's research on environmental image reflects how city images are organized by Gestalt laws. They also filled parts of the story proposed by Kaplan and Kaplan's (Kaplan & Kaplan, 1982) in theorizing environmental clarity in terms of coherence.

4) Conclusion of Development in Environmental Perception

Based on the above discussion, environmental perception has diverse and mixed forms. It is embedded with stimuli-response associations in forming environmental preference or aesthetic experience. It is related to information necessary for adaptive behavior. It is an innate ability of perceiving functions and values of an object. It is related to laws of meaningful perception of environments. However, in any of these perspectives, the question of "what is it" may be answered but "where am I" is never addressed. How do people move from one point to another along with environmental information? The knowledge gap is filled by scholars who are interested in environmental cognition; they provide a better understanding of relationships between movement and spatial perception. Although Wohlwill and Lawton recognized the importance of cognition in interactions with environments, they provided little explanation of a basic mechanism underlying cognitive processes. In the following section, some key theories exploring environmental cognition are discussed.

2. Environmental Cognition

The selected scholars of environmental cognition (e.g., Downs & Stea, 1973; Kaplan & Kaplan, 1982; Lynch, 1960) are not interested in light changes on the retina (stimulation energy) but environmental information in a larger context within which people reside (Ittelson, 1978). These scholars (Figure Q-4) are influenced by the above perception theories but they have hesitancy about perception-only explanation in people's interactions with environments. From their perspectives, there is also a cognitive system existing that specializes in processing, retention and synthesis of environmental information (Ittelson, 1978).

A major interest of these scholars is "cognitive map", a product of the cognitive system. It is a critical theoretical component in cognition- based psychological processes of environments (Holahan, 1982). Lynch (1960) and Appleyard (1969) studied cognitive maps in an urban scale. They articulated physical attributes of urban environments in construction of environmental images. Following them, Down & Stea

(1973) made great efforts in theoretical development of cognitive maps; they specified functions and representation of a cognitive map but relatively understate roles of its physical components. Kaplan & Kaplan (1982), with an evolutionary assumption, explored adaptive values of cognitive maps. They argued environmental preference is built on cognitive clarity related to formation or access to cognitive maps for survival. Following Kaplan & Kaplan, Weisman in his early research is interested in cognitive maps and campus wayfindings, and later, he began to address legible environments in long-term care settings (Weisman, 1981; 1982; 1987). Different from the previous

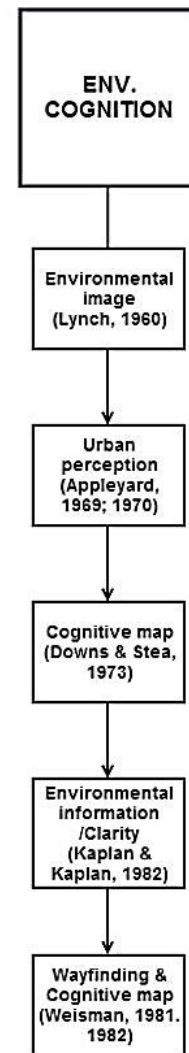


Figure Q-4. Key theorist of environmental cognition

research, Weisman's studies call attention to a holistic approach to physical, organizational and social environments in improving older adult's spatial orientation.

One shared features among these scholars is that their concepts underscore memory or past experience and they shift attention from affect to spatial behavior (Table Q-2). Except Weisman, these scholars rarely consider social context as well as meaning or significance of cognitive maps.

Table Q-2. Comparison of major theoretical models of environmental cognition

	Lynch	Appleyard	Downs & Stea	Kaplan & Kaplan	Weisman
Personal environments					
Environmental knowledge/ Cognitive image	●	●	●	●	●
Sensory experience/ Visual information	●	●	●	●	●
Emotion/Affect	◐	○	○	◐	○
Activity/Movement	●	●	●	●	●
Spatial identity	●	●	○	○	○
Meaning/Significance	◐	◐	○	○	●
Memory/ Past experience	●	●	●	●	●
Learning	◐	◐	○	◐	○
Evaluation	◐	◐	◐	●	◐
Physical (objective) environments	●	●	◐	◐	●
Social relations	○	○	○	○	●
Organizational/aggregated environments	●	●	○	○	●
● Full emphasis; ◐ Some emphasis; ◑ partial emphasis; ○ irrelevant					

1) *Environmental cognition and cognitive maps*

▪ ***Lynch's environmental image***

Lynch's study (1960) about "environmental image" or "mental image" (p. 8-9) is one of initial works on cognitive maps. His environmental image refers to an internal spatial and object representation that exists inside people's head; it is "the product both of immediate sensation and of the memory of past experience, and it is used to interpret information and to guide action...that this image has wide practical and emotional importance to the individual." (p. 4) He identified three

properties of environmental images including identity, structure and meaning, that is, an image of an environment consists of its physical signature, relationships between elements, and meanings assigned by observers. As commented by Lang (1987), Lynch explored more aspects of identity and structure and gave less attention on significance of forming cognitive maps (Lang, 1987).

To Lynch, a workable image facilitates efficient spatial behavior or adaptive behavior; it often results from an imageable or legible environments with physical objects that “give a high probability of evoking a strong image in any given observer” or make themselves “not only able to be seen, but are presented sharply and intensely to the senses. “ (p. 10). Five elements including paths, districts, nodes, landmarks and edges were identified by Lynch as important physical features to make cities imageable and legible.

Lynch’s analysis of these elements is influenced by Gestalt laws (Lang, 1987) and also Gibson’s ecological perspective; for example, in terms of landmarks, Lynch found, “local points were remembered as clusters, in which they reinforced each other by repetition and were recognizable partly by context” (Lynch, 1960, p. 83). In other words, landmarks are in a form that is easily captured by the brain, which creates “goodness of configuration” in cities and facilitate imageability. Besides, Lynch pointed out “path may not only be identifiable and continuous, but have directional quality as well: one direction along the line can easily be distinguished from the reverse. This can be done by a gradient, a regular change in some quality which is cumulative in one direction.” (p. 54) The concept corresponds to Gibson’s description of texture gradient that serves as cues of depth perception, size, direction and distance (Gibson & Gibson, 1955, cited in Lang 1987); it indicates that people’s movement in legible cities is guided by environmental structures whose embedded information can be easily picked up by observers.

Another Gibsonian influence can be found in the way Lynch characterized objects according to their probability of human action (Reed, 1996); he mentioned, “A sequential series of landmarks, in which one detail calls up anticipation of the next and key details trigger specific moves of the observer,

appeared to be a standard way in which these people traveled through their city.” (p. 83) Invariant properties in series of landmarks suggest continuous actions and things to be anticipated; dynamics is created between information seekers and physical details, in which active observers experience changed or transformed optic array, which brings more valuable information regarding location or direction.

Lynch found that these elements (paths, districts, nodes, landmarks and edges) in environmental images coexist in a cluster; he mentioned, “Most observers seem to group their elements into intermediate organizations, which might be called complexes. The observer senses the complex as a whole whose parts are interdependent and are relatively fixed in relation to each other.” (p. 85). Again, the emphasis on the total context and spatial organization confirms to principles of Gestalt psychology. However, Lynch did not explore whether there is any cultural significance embedded in the organization; in other words, it is unclear where there is a relationship between specific organized patterns and a particular group of community members.

Lynch discovered that environmental images are distorted from real environments. He described, “The image itself was not a precise, miniaturized model of reality, reduced in scale and consistently abstracted. As a purposive simplification, it was made by reducing, eliminating or even adding elements to reality, by fusion and distortion, by relating and structuring the parts.” Despite the distortion, there is a strong invariance with respect to the real world and some consensual qualities exist among different individuals. The invariant and consensual quality is called “public image”, which is referred to as “the common mental pictures carried by large numbers of a city’s inhabitants: areas of agreement which might be expected to appear in the interaction of a single physical reality, a common culture and a basic physiological nature.” (p. 7). In a pragmatic perspective, public images facilitate communication because a group of people are connected with “a shared system of symbols and a common mode of communication” (Holanhan, 1982); given the agreed-upon knowledge, inhabitants

would know better to reach consensus in group activities or to perform successfully within an environment (Lynch, 1960).

- ***Appleyard's urban perception***

Following Lynch (1960), Appleyard is interested in mental construct of urban environments. Based on his study on City of Ciudad Guayana, Venezuela (Appleyard, 1969, 1970), he found there are three aspects of urban perception: operational, responsive and inferential, each of which has a unique attributes (Table Q-3). Operational attributes refers to perception of visual and social-functioning cues (e.g., gas station, hospital); they contain agreed-upon value or social meanings within a society. Responsive attributes are related to perception of structure in terms of forms and connection of different elements (e.g., color, patterns, style, and building groups); they are the elements described in Lynch's study (Appleyard, 1973) related to imageability. Inference perception describes symbolic perception of environments (e.g., name, number, communication); it is embedded with an assessment process in which people match each new experience with their general expectations that is shaped by individual's previous experience, value, culture, and rules. "Perception in this sense can be seen more as a cognitive decision process: fitting into categories, predicting probabilities, forming and testing hypotheses." (Appleyard, 1973, p. 110)

Table Q-3. Appleyard's three components of urban perception

Components	Attributes
Operational perception	<i>visibility and activities</i>
Responsive perception (imageability)	<i>intensity and singularity of physical form</i>
Inference perception	<i>cultural significance to a community</i>

The three aspects suggest three basic components in a cognitive map: "activity", "image" and "symbol" (Appleyard, 1973), representing two types of information access: direct experience with environments and indirect experience obtained through language communication (Appleyard, 1969, p. 112). More specifically, Appleyard think people receive direct information from environments (objective

dimensions) and also from interpreted environments; a cognitive map is thus objective and phenomenological in character. However, as Appleyard pointed out, there are some tensions between the two dimensions when responsive perception (forms and configuration) extremely mismatches operational (social meanings) and inferential perception (symbolic environments). Some resistance or compromise may appear to maintain mental stability. Appleyard (1973) describes, “Our discourse with the environment, which is in any case a sporadic one, is continually shifting between subjective and objective, personal and environmental poles, according to our familiarity, experience, or mood the task at hand, and the configuration of the environment. “ (p. 111) Such dynamic concept of cognitive maps —shifting between personal and environmental poles —reveals some frustration in describing mental images; the underlying reason behind the frustration may be a lack of theories in conceptualizing the objective-subjective changing qualities (or objective-subjective struggle) in defining people’s interactions with environments.

- ***Downs and Stea’s theoretical construct of cognitive map***

Downs and Stea (1973) defined cognitive maps as “convenient sets of shorthand symbols that we all subscribe to, recognize and employ; these symbols vary from group to group and individual to individual, resulting from our biases, prejudices and personal experiences” (Downs and Stea, 1973, p. 9). Cognitive mapping was referred to as “a process composed of a series of psychological transformations by which an individual acquires, codes, stores, recalls, and decodes information about the relative locations and attributes of phenomena in his everyday spatial environment.” (Downs and Stea, 1973) Mapping processes, undoubtedly are involved with short-term and/or long-term memory (Downs & Stea, 1977). According to Ittelson (1978), short-term memory allows immediate recognition of form and structure with continuity over time, while long-term memory is related to retention of information and transformation of information into symbols. Given emphasis on the role of memory, Downs and Stea made a clear distinct between environmental cognition and Gibsonian perception.

Following Lynch, Downs and Stea contend that a cognitive map is not replica of reality. It has four features that make it different from the real world: 1) incompleteness; 2) distortion and schematization (i.e., symbolization or categorization); 3) augmentation and 4) group and individual difference; the four features are how people represent geographic environments and deal with information about 1) where certain valued things are and 2) how to get to where they are from where he is (Down and Stea, 1973). To them, a cognitive map transforms “objective (geographic) to functional space” (Stea & Downs, 1970, p. 6); it is a basic survival mechanism and a major determinant of human spatial behavior (Downs and Stea, 1973).

Following Fishbein (Fishbein, 1963, cited in Down & Stea, 1973), Down and Stea argued that a cognitive map is evaluative in nature; it is a part of people’s attitude toward environments; they pointed out, “the processes of perception and cognition that lead to predispositions to behave in certain ways toward object classes as they are conceived to be are termed attitudes” (Downs and Stea, 1973, p. 14). Therefore, attitude has both cognitive and affective dimension, concerning existence and nature of objects as well as feelings and evaluation of them; it expresses behavioral intention and therefore predicts the way people interact with objects (Down & Stea, 1973). For example, a cognitive map of restaurants around home is embedded with individual’s evaluation toward quality of the restaurants. From their perspectives, “preference” has a similar function with attitude, but it is associated with 1) a specific object rather than a molar environment and 2) a short duration rather than permanent reaction. Compared with Lynch and Appleyard, Down and Stea gave more emphasis on an evaluative property of cognitive maps, although it remains vague and unspecified. For example, it is unclear whether a positive attitude toward an environment will enhance its imageability or an imagable environment will lead to a positive attitude.

- ***Kaplan & Kaplan's environmental knowledge, clarity and evaluation***

Some of the unanswered questions in Downs and Stea's study were attended to by Kaplan & Kaplan (1982) in their book, *Cognition and Environment*. The whole book highlights experiential aspects of environments and contains three major themes: a) a cognition-dominated psychological process of environments, b) an experiential dimension of environments that reflects convergence of cognition, environments and actions, and c) environmental preference that is concerned with evaluation of possibility of survival. They are central concepts of Kaplan and Kaplan's theory and have been recognized as important contribution to environmental aesthetics (Hartig & Evans, 1993).

- a) *A cognition-dominated psychological process of environments*

Based on an evolutionary assumption, Kaplan & Kaplan (1982) argued that cognitive maps are essential to support effective functioning within environments. From their perspectives, environments are diverse and uncertain, cognitive mapping must be able to find similarity, to access to information immediately and reliably, and to code information economically. Parts of their arguments challenge previous knowledge about little cognitive intervention in people's quick encountering with environments. From their perspectives, "perceiving is inherently a cognitive process, and thinking in turn depends upon the structures that arise out of perception." (p. 11) In other words, a cognitive process can be and has to be a quick onset reactions to environments, allowing human to recognize a set of stimulation and to deal with their relationships with its background; as they mentioned, "the whatness (object) and whereness (space) aspects are essential to perception regardless of which sense is involved" (p. 18), that is, discussion of perception has to deal with "recognition" and "location". However, the two issues have been the weakest link in the perception theories mentioned in the above; it was dealt with by Kaplan and Kaplan by emphasizing existence of cognitive systems.

According to Kaplan & Kaplan (1983), object and spatial recognition is associated with "representations"; it is synthesis of input information or a memory-based image related to inference

and analysis of environments; objects, events or particular places are often coded as representations. However, a representation is just a building block or image unit, which cannot help people to comprehend whole relationships or anticipate what is around or what happens next. To behave efficiently, human needs a cognitive map, a collection of related representations characterized by continuity. Kaplan mentioned, "It is this continuity issue that makes the difference between a collection of isolated representations and a coherent structure, a cognitive map of space and time." (p40) In other words, a cognitive map is composed of associated representations.

The association between representations came from "the result of sequences we have experienced" (Kaplan & Kaplan, 1982, p. 42). The sequences consist of rules and routes people take. In Kaplan's example of how an American citizen, John, travels in his everyday life, John's representation of home and offices is involved with his sequences of going to work before and after taking kids to school from home or picking up kids from school (rule and routes). The sense of continuity strings his different representations. Furthermore, different sequences sharing common places making more discrete representations connected, for example, if kids are at home, after work, John sometimes go to a tavern on the way of the auto parts. John's cognitive map is thus structured by different representations connected with routes with shared features. What Kaplan did not address is why John has such rule and routes, and how his cognitive map differs from or resembles others. From Appleyard's perspective, the answer may be related to inference perception that reflects cultural significance of a specific group; John's social norms, value or meaning of being a father may outline his rules and route.

To conclude, Kaplan & Kaplan see their position as a modified information-process approach (Kaplan & Kaplan, 1982); different from tradition stimulus-to-response model, they are more interested in context of stimulus information, which corresponds to the Gibsonian and Gestalt approach. However, at the same time, he also distinguishes himself from Gibsonian psychologists by emphasizing cognitive processes in people's interactions with environments.

b) Experiential dimensions of environments

According to Kaplan & Kaplan (1982), there are two basic human needs for survival: making sense and involvement; they are related to immediate or future use of cognitive maps. Making sense refers to feelings of familiarity with environments, and a process of utilization of developed cognitive maps; in an environment that people are familiar with, existing information can be immediately retrieved from cognitive maps. Involvement refers to actions of seeking useful information in uncertain environments; through involvement, people have opportunities to add new data in existing cognitive maps or to develop a new cognitive map. Kaplan proposed four properties of environments based on how cognitive maps are used immediately or in the future. They include coherence, legibility, complexity and mystery (Table Q-4).

Table Q-4. Kaplan & Kaplan's four properties of environments related to utilization of cognitive maps

	Making Sense	Involvement
<i>Present Or Immediate</i>	Coherence	Complexity
<i>Future Or Promised</i>	Legibility	Mystery

Coherence: Environments with coherence allow people to easily organize information and capture embedded patterns. This property reflects Gestalt's concept of "goodness of configuration", suggesting how environments are perceived in Gestalt laws of visual organization. Coherence is thus an interpreted result of people-environment interactions, which can be described as a state experienced by people who are able to quickly access to location and contour information, and immediately aware of where important resource is.

Legibility: Legible environments allow people to "explore extensively without getting lost" (Kaplan & Kaplan, 1982, p. 86); people can plan ahead for travel and follow planned routes without feeling of confusion. According to Lynch (1960), legible environments are characterized by five critical elements: paths, landmarks, nodes, districts and edges, from Kaplan & Kaplan's perspective, these elements only

serve as anchor points in representations; A workable cognitive map needs continuity between representations.

Complexity: The degree of complexity suggests how much information can be extracted and whether environments are worth building up a cognitive map. It influences the extent to which people like to continue to explore environments after a quick scan. “Complexity” has been a research topic discussed by Berlyne (1960), Wohlwill (1968), Kaplan et al (1972) and Ulrich (1986). Berlyne operationalized “high complexity” as a great amount of dissimilar elements; he is interested in element complexity and its relations with affective responses. Wohlwill, Kaplan and Ulrich started concern a scene’s complexity in relations with environmental preference. Wohlwill (1976) in his review article pointed out scholars often encountered some issues of distinguishing complexity from diversity. While facing the same struggle, Kaplan leans toward subjective analysis of complexity in terms of observer’s experience in richness or diversity.

Mystery: According to Kaplan & Kaplan (1982), “mystery involves the inference that one could learn more through locomotion and exploration.” (p. 85). Environments with mystery imply that people can experience new information in near future; mystery suggests a place is worth spending time with to expand one’s cognitive map; in other words, a mysterious place affords adventure, prediction and new discovery (Kaplan, 1987; Stephen, 1986). It has been noted that mystery is a critical component to differentiate nature from built environments (Eliovson, 1986). A famous example of mysterious environments is Central Park designed by Olmsted (Olmsted, F.L., 1822-1903)(Beveridge, 1995), in which interplay of sunlight and dark shadows or narrow views lead by dark tunnels creates mysterious scenes (Slavicek, 2009).

Kaplan's conceptualization of the four properties bring "human as entity" rather than "neural reaction" into the thinking of people-environment relationships. More specifically, it suggests that people have desires to make things work and make things happen (Reed, 1996); the role of human being become more active in dealing with environments; they locate useful resource and search survival meanings by exploring new things; they practice their information capabilities, and increase spatial knowledge. Another significant contribution Kaplan made is integration

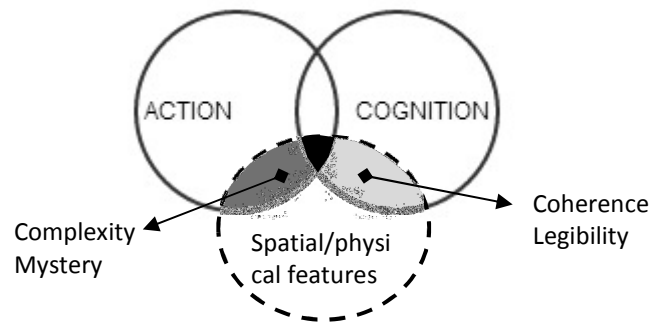


Figure Q-5. An attempt of schematizing Kaplan's conceptualization of environments

of subjective and objective environments, a way of describing environments that may ease frustration that Appleyard mentioned. The four properties: coherence, complexity, legibility and mystery are "experiential properties of environments" (Kaplan & Kaplan, 1982). They have both subjective and objective descriptions of environments; for example, complexity can be objectively measured, and also be described as a state experienced by people who are making prediction and calculating next move based on environmental information. The four properties are thus transactional results of subjective and objective environments.

An attempt of schematizing Kaplan & Kaplan's experiential properties of environments is made. As illustrated in Figure Q-5, "coherence" and "legibility" are results of interactions between environments and cognitive processes; they reflect Gestalt laws of visual organization and Lynch's concept of environmental images. "Complexity" and "mystery" are results of interaction between environments and actions; they refer to searching activities in unknown environments. As described by Kaplan & Kaplan (1982), "making sense and involvement are complementary facets of a person's experience with the environment. They neither mutually exclusive nor opposite ends of a continuum

where some optimal value is desired...Making sense without involvement characterizes the boredom with the familiar; involvement without making sense is the essence of being lost. "(p. 89) For example, mysterious environments that encourage involvement must have continuity (a critical component of cognitive maps) to facilitate navigation and planning alternative routes for new discoveries (Kaplan & Kaplan, 1982). The overlapping area among action, cognitive processes and environments suggests convergence of making sense and involvement. From evolutionary perspectives, this area provides the highest probability of survival; environments with such quality will be undoubtedly preferred.

In this diagram, "spatial/physical features" are circled with a dashed line because Kaplan's definition of it remains abstract. The overlapping area between action and cognition keeps blank because Kaplan did not address the interplay between the two. It can be interpreted as rules that reflect one's action is guided by his or her understanding of environments or society. Despite some missing discussion, the model suggests more complex relationships than a stimulus-to-response interaction, creating many potential for future discussion.

c) Environmental preference

Kaplan & Kaplan (1982) argued "we have preference for environments that are more likely to enable us to meet our needs in the future" (p. 80). Environmental preference is thus involved with evaluations or calculation of possibilities of survival. They argued the evaluation process has been adaptive in evolution so it can happen so quickly and automatically without obvious external factors or events ask for the action. A preferred environment "can be highly familiar situations in which one feels one is constantly seeing new things." (Kaplan & Kaplan, 1982, p. 93) In other words, environments that afford both involvement and making sense is immediately and automatically preferred. Figure can be modified as the following diagram (Figure Q-6) by adding the concept of evaluation. The central area of the diagram where action, cognition and environments merge represents experience of preference.

Following William James (James, 1892), Kaplan argued one indicator of being in preferred environments is rise of involuntary attention or effortless attention. Kaplan explains that involuntary attention allows directed attention that deal with daily

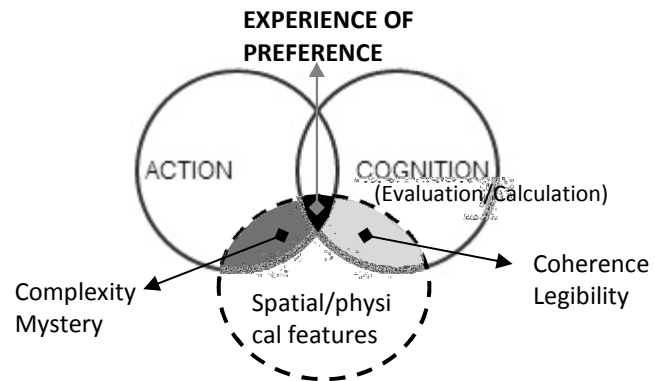


Figure Q-6. An attempt of schematizing Kaplan's environmental experience of preference

tasks to rest and recover; exhaustion of directed attention will cause cognitive fatigue and lead to low efficiency, frustration, maladaptive behavior and even danger (Kaplan & Kaplan, 1989). Most of natural environments are found to trigger involuntary attention and help restore directed attention (Hartig, 2004; Kaplan, 1995; Kaplan & Talbot, 1983) but few types of built environments (e.g., museums) are recognized as restorative (Kaplan et al., 1993).

Kaplan and Kaplan (1989) further found that natural environments with four components: being away, fascination, extent and compatibility help restore attention in particular (Table). Many scholars have viewed these components as indicators of environmental preference; they made great efforts to develop instruments for measuring the indicators and to understand their relations with environmental likeness/dislikeness (e.g., Herzog et al., 2003; Laumann et al., 2001; Staats et al., 2003).

Connection between four restorative components (being away, fascination, extent and compatibility) and the four experiential properties (coherence, legibility, complexity and mystery) is not fully discussed by Kaplan & Kaplan. Hartig argued each of the four restorative components has multiple facets, and associates with different factors at the same time. One of his studies (Hartig et al., 1997) is to understand preference of natural environments from 313 university undergraduate students; the results are used to revise their early instrument, Perceived Restorativeness Scale (PRS), and to understand whether “legibility” plays a larger role in “extent” than in “compatibility”. Their findings suggest that it is

hardly to conclude that legibility is more an aspect of compatibility than extent due to measurement issues. However, based on Kaplan's description and other scholar's interpretation (Table Q-5), it is reasonable to infer a link between fascination and complexity or mystery, and to speculate a relationship between extent and coherence or legibility.

Table Q-5. Kaplan & Kaplan's four properties of restorative environments

Components	Concepts	<i>Inferred connection with the four experiential properties</i>
Being away	Being in nature environments means getting away from place where directed attention is heavily utilized. Hartig et al (1997) argued that physical distance is less critical than psychological distance in senses of being away. They suggest three ways of having senses of being away including 1) leaving from undesirable distractions, 2) distancing from everyday routines and 3) temporarily stop pursuing a particular purpose. As suggested by Marcus (1999), individuals may feel being away by just looking at a picture or even imaging a vocational place.	Need to be interpreted
Fascination	Fascination is effortless attention. It described that individuals have a strong focus on something without distraction; that is, people are in a status of cognitive clarity. Sources inducing fascination include different events and objects (e.g., sport programs, horror movie, gambling or animals), which keep people's attention effortlessly. These sources, according to Kaplan & Kaplan (1989), are characterized by some uncertainty but possibility of prediction. Some sources of fascination may cause negative affects but natural environments (e.g., clouds, sunsets, snow patterns, motion of the leaves) are ready to evoke "soft fascination" and evoke aesthetical pleasure.	Complexity; Mystery
Extent	Extent is a function of connectedness and scope. Connectedness is related to association between one element to another and to the whole. It is similar to the concept emphasized by Gestalt psychology. Senses of scope refer to physical and imaged scale of a domain. It implies that individuals can image themselves somewhere without getting lost.	Coherence; Legibility
Compatibility	Compatibility refers to resonance between environmental demands (or availability of appropriate information) and people's goals and activity. Senses of compatibility may resemble feelings of adaptive status achieved by a match between competence and environmental press, a status that is described in Lawton and Nahemow's Competence-Press model.	Need to be interpreted

To conclude, Kaplan & Kaplan's theoretic construct demonstrates a human-centered or an experience-centered concept. Although it is still based on information-processing model, their approach

allows other scholars (e.g., Weisman, 1981; Canter, 1991) to integrate with a social model that views human as agent in environments.

- ***Weisman's cognitive map and wayfinding***

Kaplan has a strong theoretical foundation in explaining how a cognitive map is utilized and constructed. However, few descriptions of “environments” is provided; a question such as what physical attributes are associated with mystery or coherence is not really discussed. On the contrary, Lynch addressed tangible aspects of environments (visual and spatial features of cities) but gives little attention on theoretical analysis. Weisman (1981; 1982; 1987) takes advantages of both approaches to understanding wayfinding behavior. His early work (Weisman, 1981) on campus buildings addressed issues of legibility and spatial orientation. Quantitative analysis allowed him to conclude a predictable relationship between visual/spatial variables and wayfinding behavior. One of significant contribution is that the study complements Kaplan's theory in describing legible physical environments.

Weisman's (1982) later study was influenced by Lawton; he saw low legibility (obstacle in utilization or formation of cognitive maps) as environmental stress impacting human behavior, and argues old adults with decreased spatial abilities are subject to such demand. His research on physical environments of a nursing home aims at creating a legible environments and mitigating wayfinding problems (Weisman, 1987). He then developed several strategies in improving way-finding. The strategies comprise twofold directions. First, based on studies of Lynch and Appleyard, he suggests that it is important to provide architecture design that assists residents in wayfinding in a consensus level (landmarks, signs or visually perceptual access), and second, following Kaplan, he suggests that social and organizational environments should allow residents to develop their own spatial representations by encouraging them to select individual symbols as anchor points of mental maps (e.g., personal significant items or visual features). Purposes behind the strategies are to enhance resident personal control, independence and other factors that contribute to resident quality of life; from Weisman's

perspective, environments where people can easily use and create cognitive maps are not only prosthetic but also therapeutic. Evidence has shown that resident perceived control is associated with cognitive clarity in terms of knowing where they are and how to get to a destination (e.g., bathroom or dining room) without staff assistance (e.g., Kovach et al., 1997; Zeisel, 2005).

Weisman's strategies highlight a spatial-social approach on cognitive maps. His study conveys a message that to improve wayfinding, there has to be legible physical settings and corresponding social and organizational environments. In other words, different environments must have equivalent concerns of wayfinding. The consensual dimension of environments later becomes the essentials of Weisman's theoretical construct, which will be elaborated in the Chapter 3.

2) Conclusion of development of environmental cognition

Understanding of cognitive maps has been limited to a binary conceptualization; it evolves from Lynch's description of physical worlds (objective), Appleyard's concept of shifting between personal and environmental poles (objective-subjective dynamics) to Kaplan's experiential dimension of environments (subjective). Weisman provided a new perspective beyond the binary, which allows discussion of socially-constructed experience of mental images and spatial behavior. As the field expanded from the concerns of city, natural environments to a specific setting characterized by a particular value, culture, and norms, the attention shifts from functions of cognitive maps to a more inclusive understanding of people-environment relationships. It is becoming increasingly apparent that we need a holistic and multifaceted approach. Weisman's research is of particular interest as it explicitly incorporates different dimensions of environments of nursing homes (physical, social and psychological aspects); his approach contextualizes cognitive maps and transforms environmental information into architectural differentiation. Yet some issues may emerge as knowledge of cognitive maps is applied to understanding spatial behavior in nursing homes or other institutional settings. For example, how is access to or formation of cognitive maps allowing a holistic assessment of behavior, emotional, social

and physical function? The question leads to the quest for theory specifying linkage between cognitive systems, environmental evaluation and behavior, and conceptualizing relationships between different dimensions of environments. Several scholars include Altman and Canter have made efforts to answer that. A brief discussion will be provided in the later section.

Appendix R: Theories of Environmental Action, Knowledge, Evaluation and Meaning Shaping Research on Institutional Outdoor Environments

1. Action, Environmental knowledge and Evaluation

1) Synthesis of action, knowledge and evaluation

There are diverse approaches to understanding human actions on environments (Figure R-1). Berlyne (1960, 1971), one of representative scholar with a neuropsychological approach, is interested in arousal changes in motivating behavior. Küller(1991), following Berlyne, argued that physical as well as social environments can change emotional levels and lead to approaching or withdrawal behavior. Kaplan

& Kaplan (1982) modified Berlyne's model, revealing importance of environmental knowledge and evaluation in behavior motivation. Golledge (1991) broadened Kaplan's definition of environmental knowledge, and provided a model to explain a decision-making process of spatial behavior, in which each step is involved with continuous actions, access to knowledge and evaluation. One common feature among these scholars is that behavior is explicitly or implicitly in relations with assessment between expectation and external information (Table R-1).

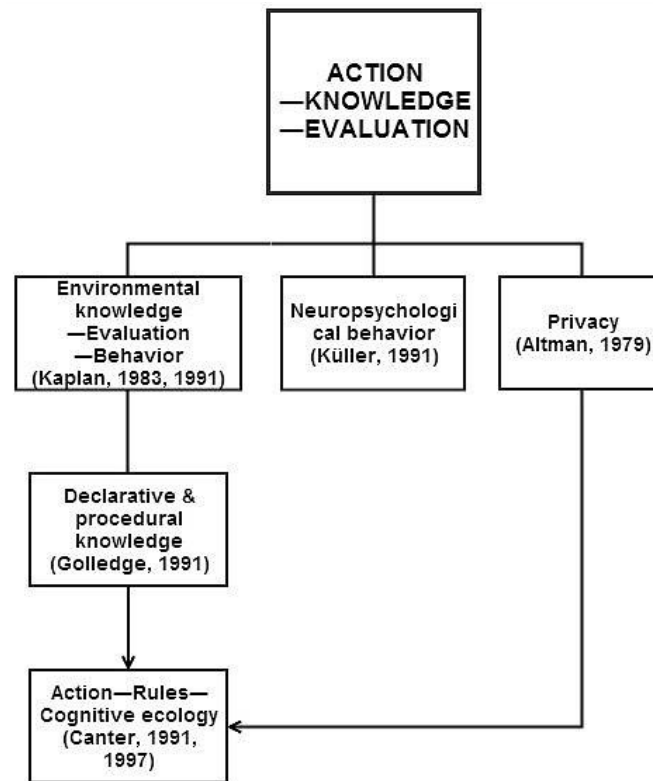


Figure R-1. Theories related to synthesis of action, knowledge and evaluation

Another group of people applied a social-psychological approach. For example, Altman (1975) contextualized spatial behavior and proposed a model of integrating personal and social characteristics, action, psychological processes and evaluation. Canter (1991), following Kaplan, Golledge and Altman, argued that human actions are guided by actions goals, social roles and evaluation between social rules and environmental knowledge. His work addresses different levels of environments and has great influence on systemic thinking of people's interactions with environments.

Altman and Canter both highlight different dimensions of environments, which distinguishes themselves from the other scholars. Concepts proposed in this track share one attribute: an abstract description of physical environments —although they recognize importance of physical environments, their definition remains elusive.

Table R-1. Comparison of major theoretical models of synthesis of action, knowledge and evaluation

	Berlyne	Küller	Kaplan	Golledge	Altman	Canter
Personal environments						
Environmental knowledge/ Cognitive image	○	○	●	●	○	●
Sensory experience/ Visual information flow	●	●	●	●	○	◐
Emotion/Affect	●	●	◐	◐	◐	○
Neural reaction	●	●	○	○	○	○
Identity	○	○	○	○	●	●
Meaning/Significance	○	○	○	◐	◐	●
Memory/ Past experience	●	○	●	●	●	●
Learning	◐	○	◐	○	◐	○
Evaluation/Preference	◐	●	●	●	●	●
Physical (objective) environments	◐	◐	◐	◐	◐	◐
Social relations	○	◐	○	○	●	●
Organizational/aggregated environments	○	○	○	○	●	●
● Full emphasis; ◐ Some emphasis; ◑ partial emphasis; ○ irrelevant						

▪ ***Berlyne's and Küller's neuropsychological approach***

From Berlyne's perspective (1971), behavior motivation is tied to arousal. Change of arousal motivates behavior toward adaptive status (after regulation of either internal or external stimulation).

According to Berlyne (1971), some types of behavior contain biological value (e.g., eating food or seeing a dentist) and others show no survival significance; they are called exploratory behavior or aesthetic behavior. Exploratory behavior is caused by arousal changes resulted from mismatches between output information (signals) and people's knowledge or expectation. Some collative variables such as novelty, complexity, uncertainty, conflict, surprisingness and unfamiliarity reflect such mismatches and are thus treated as motivational factors. For example, uncertainty will "impel action to obtain further stimulation from, or relating to the object of the curiosity so that information capable of relieving the uncertainty can be absorbed." (p100) Following Berlyne, Küller (1991) argued social and physical environments can affect arousal levels or degree of pleasantness; the change of emotion is associated with an assessment process —judgment of good, harmless and bad —and leads to withdrawal or approach actions. Küller terms these actions regarding regulation of arousal status "control". To Küller, control behavior is thus emotion-initiated and associated with evaluation of output information provided in physical or social environments.

- ***Kaplan's environmental knowledge and evaluation in behavior***

Kaplan (1991) gave more emphasis on knowledge and evaluation in understanding motivation. From Kaplan's perspective, experience of "mismatch" results from one's internal evaluation of knowledge; it is "an assessment of how much pertinent knowledge an individual has...how much one knows about what one is getting into. One needs to take into account some assessment of how well one could cope with whatever uncertainties might arise at a later time." (Kaplan, 1991, p. 175) "The assessment of the adequacy of one's knowledge in a given situation should be readily translatable into affect." In other words, assessment of internal and external knowledge can quickly affects one's feeling or arousal and lead to approach or avoidance. For example, people may have negative attitudes toward conflict or unfamiliar environments because they suggest one's inadequate knowledge in dealing with information; they may try to keep away from these situations.

From Kaplan's perspective, "continuity" sustains exploratory behavior in new environments. Although exploratory behavior is triggered by information misfits (e.g., being in environments with mystery), it required senses of familiarity (which is necessary in navigation and planning routes) to support continuous involvement; through involvement, new knowledge is added in one's cognitive map and becomes parts of knowledge foundation that one can utilized in the future or serve as a basis for next assessment. The process suggests a loop or reciprocal process, in which behavior is not only a product of affective changes but also an antecedent of it. As shown in Figure R-2, interaction between behavior and arousal is more complicated than that portrayed in Berlyne's conceptualization of behavior.

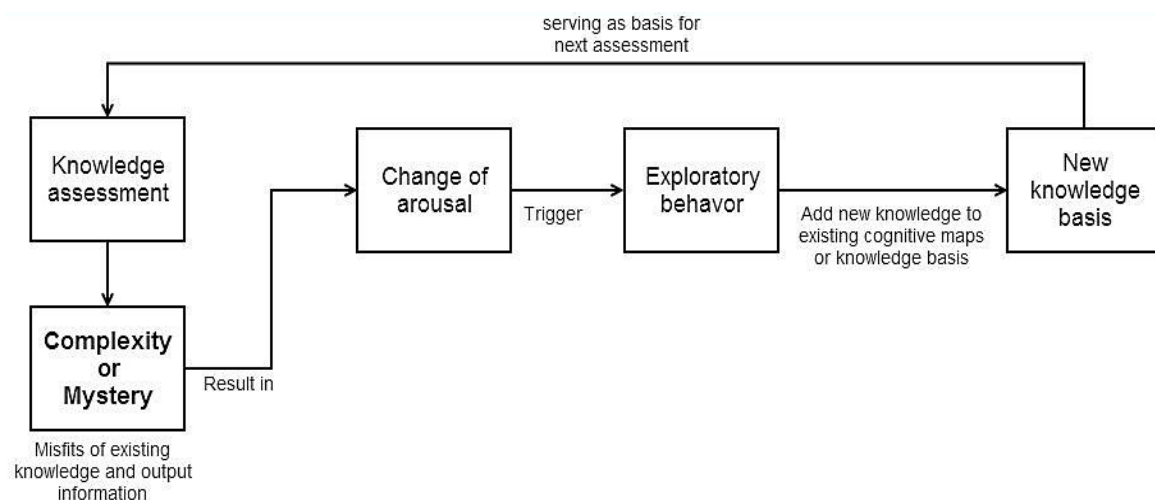


Figure R-2. An attempt of schematizing Kaplan's action-knowledge-evaluation loop

- ***Golledge's declarative and procedural knowledge***

Kaplan's environmental knowledge

is classified and defined more precisely by Golledge (1991). He described, "Environmental knowledge is acquired by interacting with, or experiencing different environments...information abstracted from these many sources is stored in long-term memory as part of a general knowledge

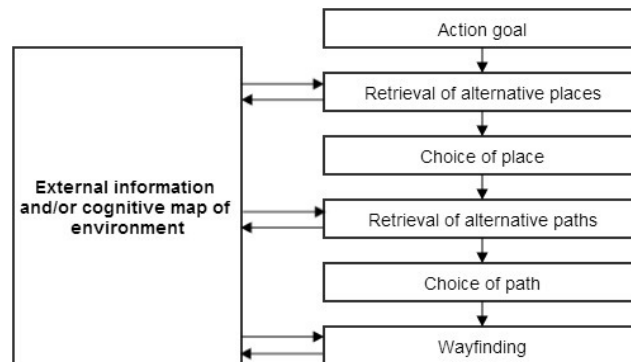


Figure R-3. Gärling & Golledge's model of decision-making processes. Reprinted from Gärling & Golledge (2000, p. 46)

structure. As the need arises, such information is processed to provide knowledge of location, distribution, pattern, dispersion, connectivity, configuration, and other properties, which assist in preparing travel plans and activating movement." (p. 35) According to Golledge (1991), environmental knowledge is represented through a map-like structure inside people's head; properties of environmental knowledge include declarative (landmark) and procedural (route) knowledge. The former is related to information conveyed by environmental cues (objects, persons, things), which provide "the basis for interpreting objects, actions and events in the external environment". The latter is related to knowledge of route or procedural development, which "guides the decisions and actions of the individual in response to perceptions and interpretation of self and environment." (p. 44) The two types of knowledge allow answering what and where questions.

Gärling & Golledge (2000) further argued that the two types of environmental knowledge are involved with a sequence of a decision process; when physiological or psychological drive or cue appears (action goal) (Figure R-3), initial acts are motivated include searching information about what it is in an environment, evaluating alternative solution, and activating a cognitive map. After a place is chosen, next step is to develop travel plans (alternative paths), image possible barriers to movement, and select

an appropriate path and destination (wayfinding). Once an act (e.g., movement through space) is realized, evaluation is initiated again (fit or misfit between expectation and experience). Results of evaluation are then added into existing knowledge base or help correct it.

Golledge's model suggests that almost each step in a decision-making process is involved with action, evaluation and creation or retrieval of knowledge. For example, Golledge explained information regarding development of a travel plan may be collected introspectively or gathered from external sources (e.g., mass media, book, computer, other people), and the process could comprise a series of searching actions, evaluation, utilization of existing knowledge and discovery of new knowledge. Golledge model, although implicit, suggests importance of surrounding resource (e.g., books, maps, people and media) in decision-making process; in other words, "context" may play a determinative role. However, Golledge's study did not go far enough in recognizing the complexities.

- ***Altman's privacy model***

With a social-psychological perspective, Altman (1975) would argue that Golledge's model decontextualizes motivation and decision-making. In his model of privacy, Altman makes some significant attempts to deal with contextual and situational factors. First, he argued that "action goals" are decided by not only biological and psychological drive but also social and environmental factors such as one's social role or cultural backgrounds. For example, to maintain "adequate" personal space may be perceived differently between Taiwanese and American commuters. American visitors may feel their personal space is invaded and like to take some actions when taking a bus in Taipei during peak traffic times. Second, Altman is interested in interpersonal actions rather than spatial behavior within an urban environment; he argued interpersonal actions should be viewed as "social behavior" because it is embedded with social values and meaning. For instance, territorial behavior that enhances ownership often reflects hierarchical social relations.

Third, Altman see individuals as change agents, who are aware of targeted action goals and know how to achieve the goals. From his perspective, people can maximize freedom of choices, and have direct control over their behavior to realize personal objectives; control on privacy is an example of human agent acting on the world. In Altman's study of privacy (1975), privacy refers to "a central regulatory process by which a person (or group) makes himself more or less accessible and open to others, and that the concepts of personal space and territorial behavior are mechanisms that are set in motion to achieve desired levels of privacy." (p. 3). Altman further explained individuals' desired privacy is shaped by personal, social, cultural, organizational, and environmental factors; behavior such as boundary control is carried out, aiming at reaching the desired level.

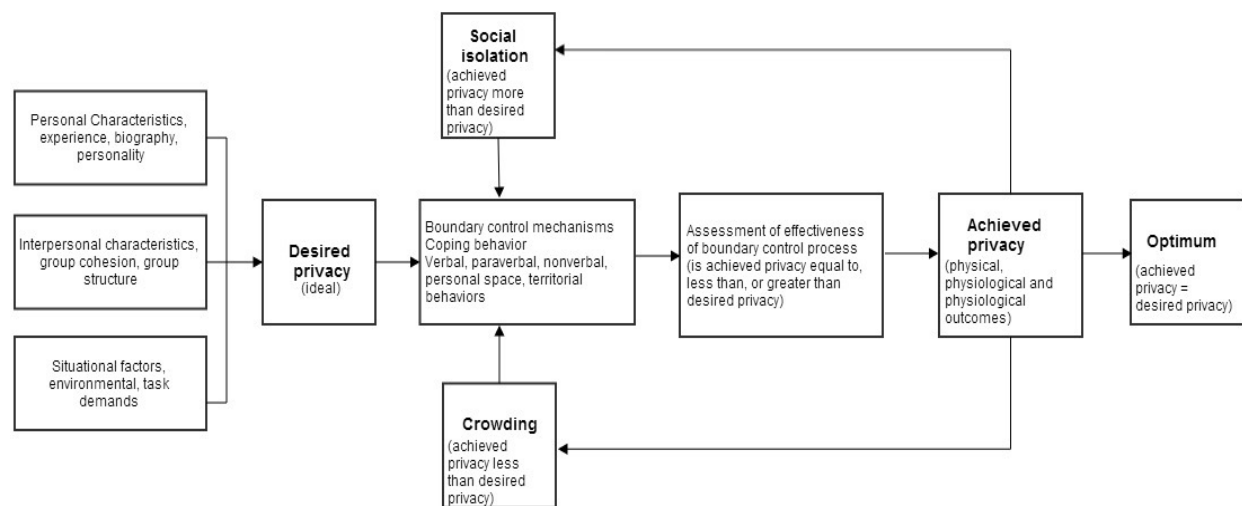


Figure R-4. Altman's model of privacy. Reprinted from Altman (1975, p. 7)

According to Altman, behavior adjustment occurs after assessment of mismatch between the desired and achieved privacy level; the assessment include evaluations of relationships between self and others, input and output information, and between different boundary control behavior. Equivalence between the achieved and desired level is associated with positive affect, improved physiological responses, high attention levels and efficient task performance. Incongruity between the two may lead

to new understanding of the worlds and new control behavior. Figure R-4 illustrates the looped process of privacy control.

The central notion of this model is that human is not merely recipients of environmental influences (Altman, 1975); human actions actually shape experience of the environments. For example, when people apply new behavioral mechanism such as adjustment of personal space to reduce social isolation or crowding, they may have opportunities of reexamining their relationships with others, and redefining who they are, where they stand and what to do (Altman, 1975).

Another important theme is that social behavior requires a systemic thinking in describing its relations with different levels of environments. In Altman's model, privacy addresses not only something inside-the-head but also person's relations with social and physical environments, which are structured by personal and group relationships, norms and culture within particular environmental properties. From Altman's perspective, privacy is like a social system with elements that have "various levels capable of substituting for, complementing, or amplifying one another." (p. 206). Altman's privacy is undoubtedly personal as well social, representing results of interactions among different sub-social systems.

If "privacy" is replaced by "legibility" in this model, legibility will be assigned with social significance. For example, desired legibility of new city dweller is shaped by their past experience, cultural backgrounds and individual physical or cognitive competence. To achieve the desired level, behavior such as adding an anchor point (objects, persons, things, events) into a knowledge structure may be carried out. For example, the new city dweller may stop by a flower shop at a street corner and talking to its florist, or visit a local auto repair; these actions may help maximize environmental knowledge and reach an optimal level of legibility. From Altman's perspective, these actions must have a particular social meaning. For example, visiting a flower shop nearby may reflect a sense of a local community ownership; spatial behavior is thus personal and social. Achieved legibility that leads to

boredom or confusion may precipitate new behavior such as information-searching to make efficient adaptation.

Parts of this concept are actually supported by Weisman's research on wayfinding in nursing home settings. In his concept, wayfinding has organizational, social and physical dimensions of environments; to facilitate wayfinding, Weisman argued behavior such as hanging one's meaningful items on doors should be encouraged. The item can be family pictures or personal mementos that reflect person's social role. Most importantly, such behavior needs not only appropriate architectural support but also efficient cooperation and involvement of residents, family members, staff and organizations.

- ***Canter's ecological cognition, rules and purposeful evaluation***

In Altman's privacy model, some unanswered questions include 1) how people know what behavior can be applied or will be appropriate to a situation, and 2) what organizes human behavior. These issues are attended to by Canter (1991) in his model regarding socially formed rule of place use. Place rules are defined as "the mixture of percepts, customs, and habits associated with place use." (Canter, 1991, p. 197); according to him, people behave based on rules they follow for effective use of environments. He explained, "...people are acting in places by relating to the rules of place use. These rules are followed, implicitly or explicitly, though, in order to act within (or against) the actions that are physically or socially possible in that place."; Altman's concept of privacy reflects such agreed principles; many implicit (e.g., personal space between males and females) and explicit rules (e.g., privacy policy for internet users) guide expected privacy levels and organize boundary control behavior. To Canter, a major premise of feasible rules is "enough people aspired to play the game"—there must be consensus understanding of environmental cues across people. For example, a common understanding of a stop sign among drivers ensures safe and efficient driving.

The understandings of physical cues related to a cognitive structure or “cognitive ecology” (Canter, 1991), which generates two types of knowledge: declarative and procedural knowledge. Following Golledge, Canter explained the former is related to personal significance of place (i.e., meaningful “landmarks” revealing connection between self and place), and the latter is related to knowledge of routes and rules. The two are internal representation of environments or “summaries of production rules” (Canter, 1991, p. 200). People behave differently in different places (e.g., supermarket, hospital, church) according to how they interpret the place and how they follow hidden and written rules and procedures. Shared environmental knowledge is thus the foundation of rules of place use, guiding people act appropriately on the worlds.

Place rules are not only shaped but also shaping the cognitive understanding; according to Canter, observable behavior that is framed by place rules influence people’s knowledge of the world; through learning and observation, people have “growing understanding of what types of physical requirements are appropriate for any particular events” (Canter, 1991, p. 199); for example, people observe and learn how chairs and a podium are arranged in classrooms. They may prefer and create a learning setting for their effective learning.

Canter further argued that the interplay between rules of place and the cognitive ecology is essential to evaluation processes (Figure R-5). More specifically, he thinks

environmental evaluation is about assessment of fitness between “knowledge of the rule systems in operation” and people’s “understanding of what is possible, appropriate, and desirable in a given place.” (p. 202) it is a process to gauge discrepancy between agreed-upon place rules (including purpose of a place, implicit and explicit policy) and individual interpretation of the worlds (i.e., expectation, goals and

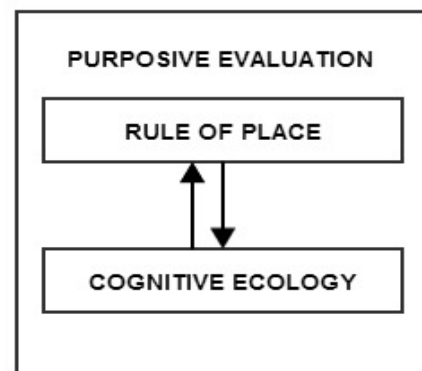


Figure R-5. Canter's conceptualization of purposive evaluation. Reprinted from Canter (1991, p. 202)

intentions). He called such assessment related to goals of place and users as “purposive evaluation” (Canter, 1991, p. 138); from Canter’s perspective (1991), examination of user satisfaction with a place is to reveal how effectively a place in terms of purpose and rules supports a person’s objectives. For example, to examine resident satisfaction with privacy control in nursing homes, one of evaluations may be related to understanding the fit between resident expected privacy and organization’s privacy policy.

Canter model suggests there is social logic of spatial behavior. The logic integrates different Altman’s social behavior (personal space, territorial behavior and crowding) into one conceptual organization, and successfully orchestrates dynamics of actions, environmental knowledge, evaluation and cues. What Canter cares most is the convergence of these factors (or in his term, place experience). To him, it is the essence of people-environments relationships. A much more detailed discussion of Canter’s approach will be provided in Chapter 3 Theoretical Framework.

2) Conclusion of “Action” Section

The six models or theories suggest a shift in conception of human behavior from a mechanic to systemic focus. The systemic approach Altman and Canter applied is holistic but lacks descriptions of physical environments; the role of physical environments is relatively neglected while more thoughts are brought forth to social environments. Many questions are still unsolved. What action is corresponding to different types of cues and knowledge? Is there classification of physical cues? How is human as agent utilizing physical environments to achieve goals in their activities? Is it possible to hold equivalent attention to physical and social environments in a systemic approach? Lawton’s (1982) classification of environment is a promising approach. Weisman’s Model of Place that will be discussed in Chapter 3 demonstrates a successful integration of social and physical environments.

2. Meaning

1) Convergence of emotion, action and identity

Tuan, Relph and Seamon are the three human geography scholars (Figure R-6), who advocated a phenomenological approach to “meaningful environments”. Their research focuses on people’s “place experience”— subjective interpretation of lived environment, and seeks reflection on meaning of being in a place. From their perspectives, place experience is conceptualized as convergence of movement/non-movement (rest), emotion and identity, in which the role of environmental knowledge is minimized, and environmental evaluation is embedded in feelings of environments (Table R-2). They emphasize “self” in relation to specific social relations (e.g., family or community) but relatively overlook physical and suprapersonal environments. Following Tuan, Relph and Seamon, Rowles had a similar transactional perspective on experience of older adults living in Appalachian community. Differently, Rowles used Lynch’s concept of environmental image to structure resident place experience, and showed more interests in physical features and consensual environments. The following discussion will review shared themes in research of Tuan, Relph and Seamon and then analyze Rowle’s work individually.

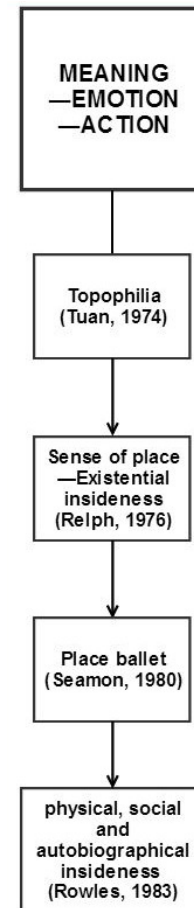


Figure R-6. Theories that address meaning of environments

Table R-2. Comparison of major theoretical concepts of environmental meaning

	Tuan	Relph	Seamon	Rowles
Personal environments				
Activity/movement	●	●	●	●
Environmental knowledge	○	○	○	●
Sensory experience (other than vision)	●	●	●	●
Emotion/Affect	●	●	●	●
Identity	●	●	●	●
Memory	●	●	●	●
Learning	○	○	○	○
Evaluation	○	○	○	○
Physical (objective) environments	○	○	○	●
Social relations	●	●	●	●
Organizational (aggregated) environments	◐	◐	○	●
● Full emphasis; ● Some emphasis; ◐ partial emphasis; ○ irrelevant				

▪ *Commonality among Tuan, Relph and Seamon*

Analysis of movement/non-movement (rest)

Tuan, Relph and Seamon are influenced by Merleau-Ponty (1945), who argued that human can only rely on lived bodies to know the world (Cataldi & Hamrick, 2007). To these scholars, movement is not information seeking activity but a reaching out personal significance and emotion to the surrounding.

Tuan argued “movement” is an aspect of place experience, requiring little involvement of spatial knowledge; “people are less dependent on imagery and on consciously held mental maps than they perhaps realize...They learn a succession of movements rather than a spatial configuration or map.” (Tuan, 1977). Tuan pointed out people in a familiar environment move based on kinesthetic and perceptual experience (i.e., kinesthesia, sight and touch), and they give little thoughts to their movement; for example, when people see a street grid, “they know a succession of movements appropriate to recognized landmarks. They do not acquire any precise mental map of the neighborhood. “(p. 72); however, when people are in an unfamiliar environment or when something is changed or unexpected, spatial knowledge kicks in. From his perspective, environmental knowledge would enhance

movement and daily action but it is not necessary; “we do many things efficiently but unthinkingly out of habit.” (p. 69).

Relph’s (1976) description of movement can be found in his concept of “existential insideness” (p. 55). It refers to a situation, “in which a place is experienced without deliberate and selfconscious reflection yet is full with significances”; it is similar to experience of acting at home and in a familiar town; people know the place intimately and unselfconsciously commit to it. Following Tuan and Relph, Seamon (1979) developed a concept, called “place ballets”, which describes sequent and habitual bodily movement following a particular time-space rhythm or routine to complete tasks of everyday life. Seamon explained that place ballet has no intervention of conscious attention; it rises out of the routine —the time-space continuity —which breeds familiarity and triggers affection and attachment (Tuan, 1974). It becomes difficult to change because people become attached to and grow emotional bound to these prescribed actions that are followed regularly (e.g., sitting at the same chair of a café at certain time to see same people).

Place is not only for movement and action but also for rest and stop. According to Tuan (1977) “place is a pause in movement. Animals, including human beings, pause at a locality because it satisfies certain biological needs. The pause makes it possible for a locality to become a center of felt value.” (p. 138) Rest refers to “any situation in which the person or an object with which he or she has contact is relatively fixed in place and space for a longer or shorter period of time.” (Seam, 1979, p. 70) Essential experience of the pause and rest is rootedness, a strong sense of land ownership that makes people always come back (Tuan, 1977). From Relph’s perspective, having roots in a place is a basic human need because it allows people to have a secure position to establish relationships with outsides. Familiarity constitutes roots; it makes people know and known in a particular place and grow attachment (Relph, 1976); people with rootedness may thus experience difficulty following relocation. Experience of rootedness ensures human existence; it suggests commitment, responsibility and future expectation;

Relph used the term, “field of care” to describe a place where people are rooted, and to portray a place that is taken care of and is ready to dwell (Relph, 1976, p. 142). Seamon (1979) suggests that the foundation of rootedness is place ballet, and argued that core of “field of care” is physical action and time; in his discussion of home rootedness, he mentioned, “through the recurring cycle of departure and return, body-subject comes to know the placement of home and its relative location in terms of paths, places, people and things”; in other words, people’s commitment to a place is established and enhanced by ritualized body movements; the commitment is weaved with actions of possession, appropriation and regeneration, creating a place of nurture and care (Seamon, 1979).

Interpretation of feelings and emotions

To Tuan, Relph and Seamon, feelings and emotions are essential to people’s perception of environments; they are experience of environments; they are how we know the worlds. Tuan argued “To experience is to learn; it means acting on the given and creating out of the given. The given cannot be known itself. What can be known is a reality that is a construct of experience, a creation of feeling and thought.” (Tuan, 1977, p. 8) Tuan’s emotion-based understanding of the world refers to two processes: multiple-sensory experience and individualization. In terms of sensory experiencing, Tuan minimized roles of vision. He described (Tuan, 1974), “seeing is objective...seeing does not involve our emotions deeply...the person who just “sees” is an onlooker, a sightseer, someone not otherwise involved with the scene. The world perceived through the eyes is more abstract than that known to us through the other senses.” (p. 10); from Tuan’s (1974) perspectives, other senses do a better job allowing people to know or feel their environments; these senses are capable of suggesting variation of mass and volume (or in Seamon’s term, “intensisty” (p. 101)) and thus imply spatial structure of the world (e.g., strength of an odor implying direction and distance of an object).

Tuan further explained that how we perceived environments is influenced by memory, anticipation and past experience; to understand a person’s environmental preference or attitude, we

have to know his or her biological heritage, education, goals and other individual characteristics and also his or her “group’s cultural history and experience in the context of its physical setting.” In this regard, preference or environmental evaluation is very subjective and individualistic; it is hardly generalized. Tuan’s discussion of crowding reflects such relativism. As he said, “Spaciousness and crowding are antithetical feelings. The point at which one feeling turns into another depends on conditions that are hard to generalize.” (Tuan, 1977, p. 51); it is very possible that “two persons in one room can constitute a crowd.” (p. 60) Besides, crowding is not always associated with negative feelings as long as individual’s action goals are supported. For example, when Taiwan was an agricultural society, crowdedness in a family symbolizes blessing and abundance because more people can help out in the fields and more food can be produced. Tuan mentioned, “The world feels spacious and friendly when it accommodates our desires, and cramped when it frustrates them.” (Tuan, 1977, p. 65)

Relph (1976) gave a similar statement, saying that people experience the worlds through their own lens in terms of attitudes, experiences and intention. Although Relph thinks it is important to recognize that “any landscape is experienced both individually and in a communal context, for we are all individuals and members of society” (p36); however, the consensual experience is not extensively addressed by Relph; he and Tuan seem to put more attention on individual variation.

Roles of place identity

To Tuan, Relph and Seamon, identity suggests inseparability of sense of self and place. Tuan describes identity as association between conscious sense of self and uniqueness of place; uniqueness of place can be created through visible physical forms or invisible means such as “rivalry or conflict with other places...the evocative power of art, architecture, ceremonials and rites.” (Tuan, 1977, p. 178) These means are embedded with processes of dramatization, in which people “dramatize the aspirations, needs and functional rhythms of personal and group life”, that is, people builds up a strong sentiment for place (Tuan, 1977, p. 178). According to Tuan, dramatization is filled with emotion; it is

associated with love and fear of place or in Tuan's term, topophilia or topophobia (Tuan, 1974, p. 4).

Dramatization is also related to reminiscence. As suggested by Tuan, when people have control over his environments, there is no need of mementos of the past; their identity can be extended from self to environments and be recognized through action. However, when people have less influence on their surroundings, they use objects to anchor time and selfhood. Personal possessions like old chairs, pictures and letters support feelings of nostalgia and senses of identity in a place. Tuan pointed out, "A man is not an archivist of his own life, obliged to preserve documents impartially for a future historian to interpret: he wants a commodious house filled with objects that support his sense of self. Valuables are kept, as are old letters and knickknacks that have sentimental worth and do not take up much space.

"(Tuan, 1977, p. 196)

Relph (1976) argued there are four components of place identity including 1) physical settings, 2) activity, 3) meaning (as a complex of intentions, experiences and viewpoints) and 4) sense of place (a direct experience of a place resulting from a full awareness of places for human self-identity, intentions, activities and meanings); they are four factors distinguishing identity from recognition. From Relph's view, Lynch's description of a city is just for recognition purpose, aiming at distinction of a place from others. It only serves as an identifiable unique address. To Relph, identity should be "in the experience, eye, mind and intentions" (p. 45); it is related to senses of belonging to a place and actions of commitment. To understand place identity, it is important to recognize not only identity of a place but also identity that "a person or group has with that place, in particular whether they are experiencing it as an insider or as an outsider". Place identity is the essence of place; people who belong to and identify with the essence are "insiders"; "more profoundly inside you are, the stronger is this identity with the place" (Tuan, 1977, p. 49).

Relph (1976) further explained that in some cases, place identity is a group or consensus image of a place; the image of place suggests socially agreed or socially constructed value; however, from his

perspective, such identity is not authentic because it is just superficial integration of group interest or is manipulated, selective and ready-made products for places from opinion-makers. Authentic identity should be experienced by people who unselfconsciously align themselves with their place, and have direct experience of place. Outsiders or strangers who have yet identified with essence of place would show self-conscious behavior; they seek to experience places with “act of judgment, a comparison of the new experience with one’s expectations” (Relph, 1976, p. 66). Seamon stands in a similar position with Relph but gave more emphasis on bodily familiarity that locates people in environments where they find themselves.

- ***Rowles’s physical, social and autobiographical insideness***

Following Tuan, Relph and Seamon, Rowles studied place identity and attachment of older residents in an Appalachian community. In his research, two major features differentiate his approach from other human geography scholars: 1) integration of Lynch’s concept and 2) emphasis of consensual environmental knowledge.

From resident interviews, Rowles (1984) found there is consensual knowledge about spatial hierarchy ranging from home, visual field, vicinity, community, sub-region to region. The six divisions are characterized by different intensity of involvement, each of which contains “distinctive meaning as an expression of identity and repository for the artifacts and memories that constitute the individual’s personal history” (p. 133). For example, as described by Rowles, visual fields are areas around home; in this area, processes of knowing environments and being known by others are continuously carried out; people monitor people from their house or stay at their porch to watch outdoor events or passing cars; meanwhile, they allow themselves to be observed.

Besides passive interactions, the visual fields also a place to exert active social control; people can easily initiate or end conversation; they can choose how and how much they like to talk to neighbors and a passerby. To old people who have more physical limitation, Rowles found they still gain senses of

involvement at visual fields through monitoring children playing. Their experience of familiarity and routine is steadily accumulated by observing seasonal changes, regular events and familiar faces.

Rowles further explained that activities carried in each of the divisions differentiated space inside from outside (i.e., outside of home is visual field, and outside of the visual fields is the vicinity); they reflect different aspects of senses of insideness with their surroundings. According to Rowles, a sense of insideness is a mixed of unconscious and cognitive processes; it consists of three major components: physical, social and autobiographical insideness. Each of the spatial division represents different forms or combination of insideness and thus makes itself distinct from others.

Physical and social insideness

Physical insideness describes old adult's bodily familiarity toward their physical surroundings. Rowles (1983) found that such insideness allows them to be aware of physical barriers and thus provides compensation for deteriorating sensory functions. With physical insideness, residents with loss of competence due to age are able to continue their life in the space. Physical insideness is linked with social insideness, which refers to people's knowledge of knowing and being known by others between generation and in the society of old. More specifically, social insideness suggests consensual understanding of a particular person's contribution to family and the community over his or her life time. The contribution is referred to as "social credit" (Rowles, 1983); it marks levels of a person's community involvements perceived by community members, and also indicates levels of other's obligation to give support to the person. Social insideness thus centers to community concerns, social relationships and emotional supports. It over the years becomes translated into an affinity to surrounding environments (Rowles, 1984). With accumulated social credits, older adults with physical limitation can gain assistance in daily life activities; environmental demands they suffer are reduced by redeeming their social credits.

Rowles's social insideness reflects shared understanding or expectation of a place; it is deep and authentic place experience embedded with emotional attachment and identity; it also serves as agreed-on value among community members and becomes an implicit social order.

Autobiographical insideness

The third component, autobiographical insideness, is related to historical dimensions of place experience. It describes phenomena that physical surroundings like home become dwellers' autobiography recording individual's life, feelings and identity, that is, home becomes "a repository of cues evoking an array of emotions", and each cue anchors temporal depth of meaning. One of Rowles's interviewee (84 years old) described her living spaces as if her husband is still alive and her children are still around; the space to the interviewee remains "in a sense in habituated by the people who years ago made them important social spaces." (Rowles, 1983, p. 304) Rowles terms the phenomena related to recollection of the past "geographical fantasy", which suggests an ability "to project oneself into the places of one's past or to become involved vicariously in contemporary spaces that may be spatially removed such as the location where one's children reside" (p. 304). The concept of "geographical fantasy" is corresponding to Stokols and Shumaker's "social imageability" (Shumaker, 1987), which describes an ability to "evoke vivid and collectively held social meanings among the occupants and users of a place" (p. 97). While Lynch's imageability of a city reveals fantasy of aggregated behavior related to physical elements in public, Rowles's geography fantasy focuses on representation of personal and social dimensions of private physical space.

The above discussion suggests that two paradigms are applied in Rowles's study. On one hand, the study treats place experience as transaction of involvement (activity), emotional bound (affect), identity and fantasy, and on the other hand, it sees place experience as socially constructed and seeks shared values and understanding among community members. Reasons of pluralistic paradigms were discussed in the study of Rowles and Ohta (1983); they argued that a holistic approach with a position

between determinism and possibilism would prevent impasse caused by objective-subject struggles in conceptualization of aging and environments. Another advantage is that the pluralistic paradigms facilitate connection between theory and practices. His later study (Rowles & Bernard, 2013) has shown a successful attempt of transforming phenomenological knowledge to socially-constructed significance of older adults' relocation. He pointed out, "As knowledge of the subjective world of the older person has evolved, we have now reached a level of sophistication that merits a focused attempt to translate deepening insight into practical suggestions and outcomes for the design of both interior (private) and exterior (public) environments. Beyond simply acknowledging and becoming more sensitive to the meaning of place to older adults, how can we constructively use a growing knowledge base to effect change that will improve the quality of life in old age?" (Rowles & Bernard, 2013, p. 5) The underlying theme of his statement suggests theoretical evolvement toward a pragmatic paradigm (Fishman, 1999), which addresses both elementary and holistic in concept to solve a particular problem in particular social programs.

2) Conclusion of "Meaning" Section

Tuan, Relph and Seamon made a significant contribution to understanding the essence of P-E relationships. It is direct, authentic and emotion-based experience developed through people's unconscious actions on lived environments. However, relativist descriptions require translation applied to practice that targets not only individuals but also a group of people who share similar characteristics (e.g., nursing and caring in long-term care settings). Rowles's approach seems to be more promising in understanding older adult's experience of institutional settings; his recognition of subjective, consensual and objective environments demonstrate theoretical flexibility and pragmatic potential in understanding relationships between older adults and their environments.

Appendix S: Analysis of Architecture Layout of Silver Life

1. Architecture layout

According to the results, the building configuration of Silver Life can be summarized into two major features: 1) separation of external from internal areas and 2) a centralized layout. These features are introduced in discussions of its four corridors and social space in the following sections. Overall, residents are required to walk a long distance to access to amenities (e.g., the courtyard) and participate in activities.

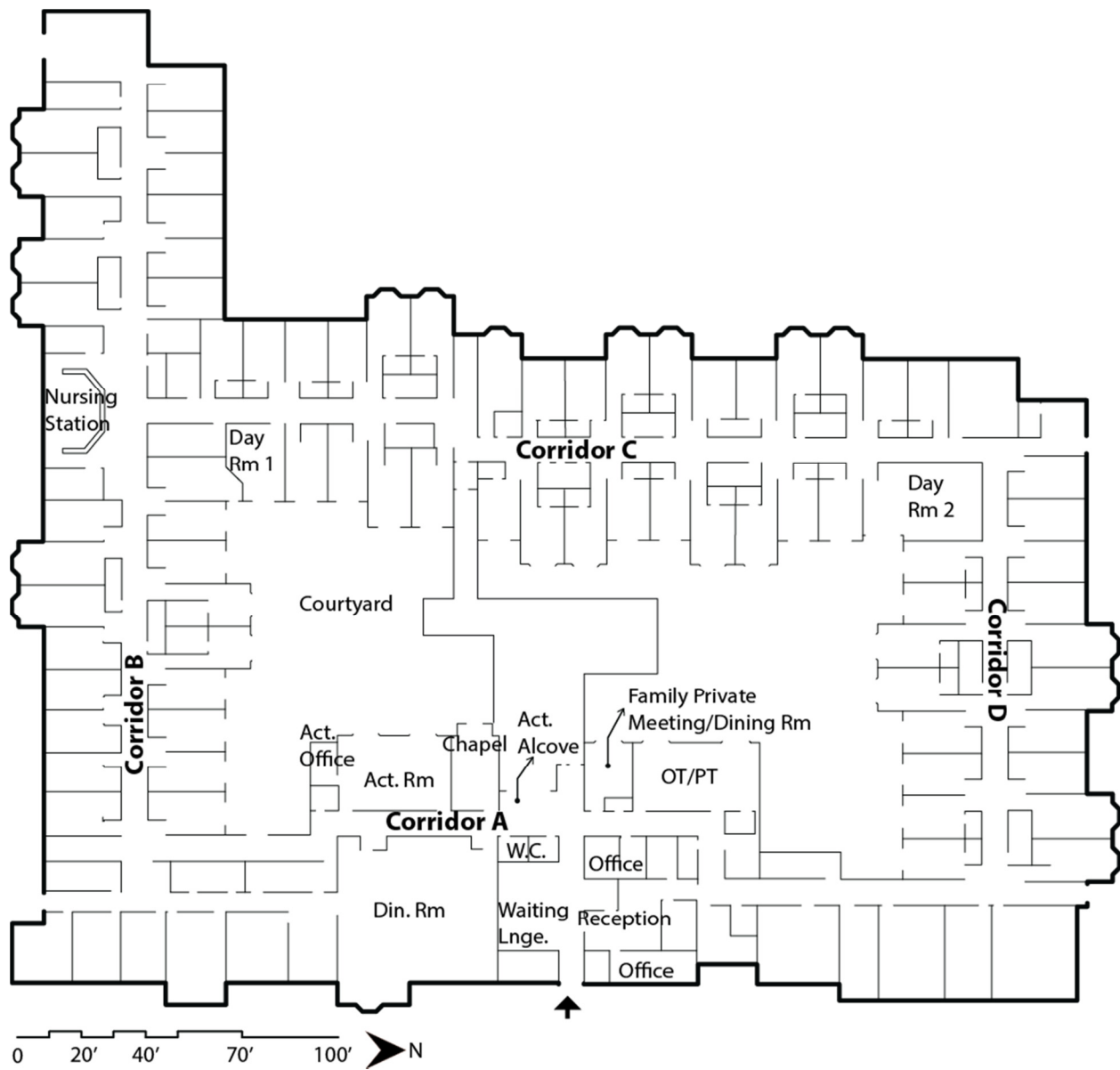


Figure S-1. Floor plan of Silver Life

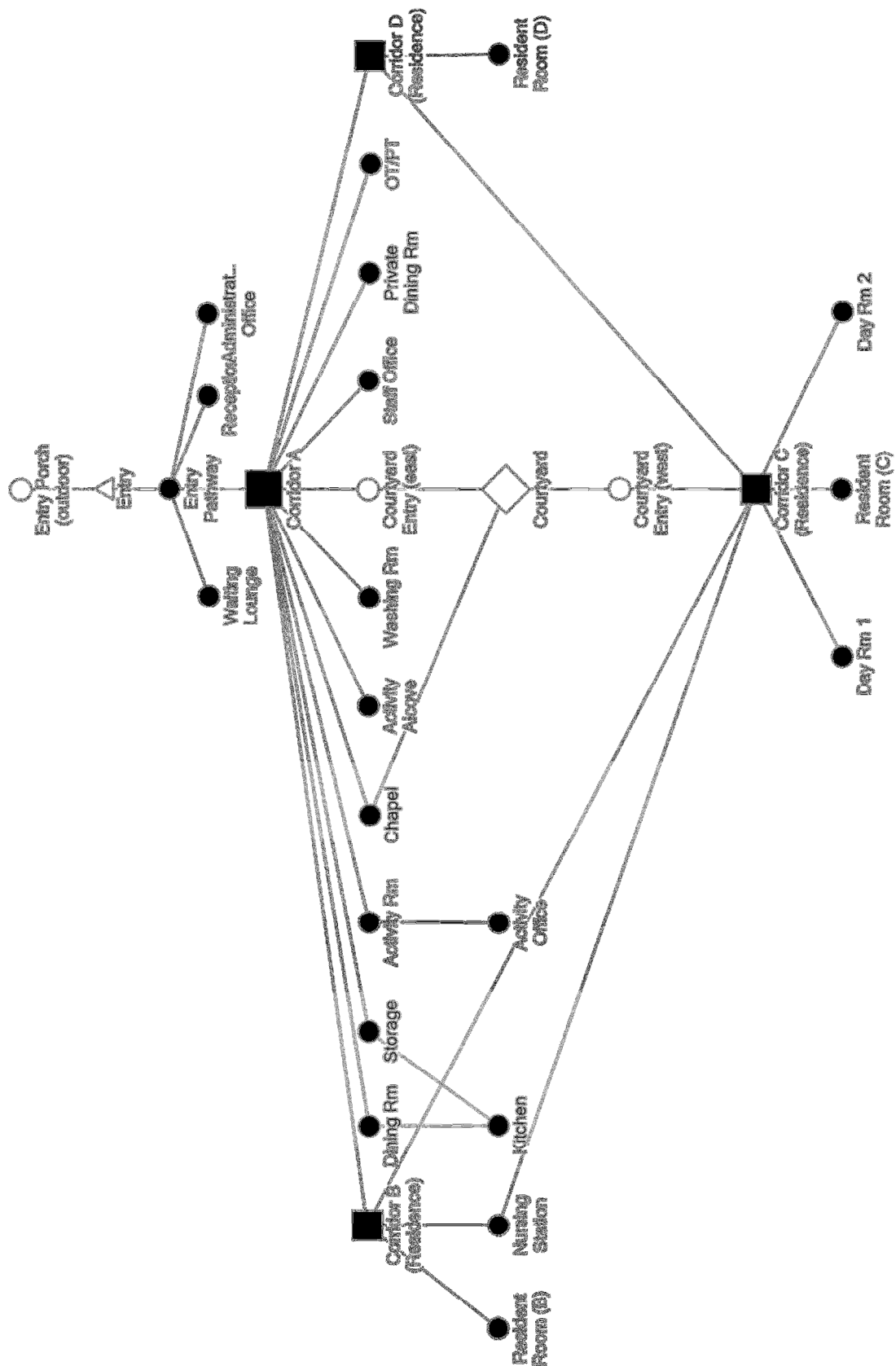


Figure S-2. Spatial network of Silver Life

Table S-1. Graph metrics of Silver Life's building layout

Location	Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality	Geodesic distance from						
					Entry	Nus.	Act.	Dining	Day	Day	Court
					STN	Rm	Rm	Rm	1	2	yard
Corridor A	13	330.000	0.020	0.130	2	2	1	1	3	3	2
Corridor B	4	87.917	0.016	0.065	3	1	2	2	2	2	3
Corridor C	7	100.833	0.013	0.049	4	1	3	3	1	1	2
Corridor D	2	68.917	0.015	0.057	3	3	2	2	2	2	3
Activity Alcove	1	0.000	0.013	0.039	3	3	2	2	4	4	3
Activity Rm	2	28.000	0.013	0.042	3	3	--	2	4	4	3
Dining Rm	2	13.500	0.013	0.045	3	3	2	--	4	4	3
Day Rm 1	1	0.000	0.010	0.014	5	2	4	4	--	2	3
Day Rm 2	1	0.000	0.010	0.014	5	2	4	4	2	--	3
Courtyard	3	13.667	0.011	0.025	4	3	3	3	3	3	--

Corridor A:

As shown in Figure S-1 & Figure S-2, Corridor A works as transaction between internal and external areas. It connects a major entry space with resident activity areas. A reception office, waiting lounge, administrator office are at the entry area so visitors can be immediately served and examined. The control of the entry space may ensure safety and security by screening undesirable visits.

According to the metric table (Table S-1), Corridor A is the center of the layout. It has a highest value of graphic degree —thirteen places (or nodes) including dining, recreational and therapeutic activity space are connected with Corridor A. From a perspective of graph theories (Hansen et al., 2010), Corridor A is very “influential” because different information is exchanged at this area and can be spread in a very quick way.

Corridor A also has a highest value of centrality metrics, suggesting that it has the highest 1) efficiency in access to other spaces, 2) connectivity with other influential areas and 3) capability of bridging different parts of the network. For example, it has easy access to the activity room, dining room and OT/PT room; it has a short connection with Corridor C; it bridges resident activity areas and staff

space. In such layout, Corridor A becomes a first-stop place before any activity, and definitely the busiest area. It is expectable that Corridor A is very congested before and after an event.

Resident Corridor B, C & D:

Resident rooms are located at Corridor B, C and D. They are away at least three geodesic distances (i.e. three connecting paths in the graph) from the entry. Such spatial depth ensures privacy and helps reduce disturbance from external activities. Corridor B and C are more close to places with caring or social resource. The former has direct access to a nursing station and the latter is connected with two day rooms and courtyard space. Their high spatial connectivity and easy access to the surrounding are reflected in a higher value of degree, betweenness centrality and shorter geodesic distance.

Corridor D is more isolated (low degree and longer geodesic distance). Although the location earns quietness or fewer disturbances from human activities, it requires efforts to travel to other corridors for resource. One advantage is that it has direct connection with Corridor A – the place with the most abundant resource – which reduces some of residents' burden to access to amenities. As shown in the metrics table, spatial relationships between Corridor D and Corridor A are reflected in its relatively high value of closeness centrality and eigenvector centrality.

Social space:

Social space of Silver Life includes an activity alcove, activity room, dining space and two day rooms. They are located at either Corridor A or C with high spatial depth (long geodesic distance to the entry). These social spaces have no direct connection with courtyard space (three geodesic distances away from it), disallowing integrating indoor with outdoor activities.

The two day rooms are very likely to be the quietest and most secluded social space; they are high in geodesic distance from the entry and other activity space, and low in degree and centrality metrics.

2. Spatial sequence, size and density

Sequence of visiting Silver Life starts at the main entry porch, which is located at the east of the building, overlooking a drop-off area. An automatic door leads people to a receptionist's office and a waiting lounge; the lounge is furnished with sofas, armchairs, an eye-catching fish tank and seasonal decoration. After the reception area, one will walk into Corridor A (8' x 351') and face the courtyard entry. No sign guides direction to Corridor B, C & D at the intersection. An activity/sitting alcove (18'x 6') is adjacent to the courtyard entry and opposite to guest washing rooms. The place is always occupied by residents conversing with passersby; it is furnished with a comfortable three-seat sofa and a large picture window overlooking a porch and courtyard patio. Decoration of this space varies according to the events; Christmas or football-party decoration is the highlight, providing awareness of time and seasons. Annual fund raising activities (e.g., selling resident home-made cookies and artworks) are also hosted here; residents who sit at this space sometime become a "one-day store manager" to take care of the "business". The activity alcove and other social/recreational spaces including the activity room (35'x 22.5'), library/chapel (14'x 22.5') and the dining room (40'x 50') make the south of Corridor A a busy section; many spontaneous social interactions occurred here, and very often it was jammed with wheelchaired residents.

Resident rooms are located on the double loaded corridor B (8'x 257'), C (8'x 287') and D (8'x 132'). The long corridors cause long travel distance from bedrooms to activity and care space. For example, the one and only nursing station stands at the intersection between Corridor B and C, which results in 50 percent of the rooms (38 out of 76 bedrooms) staying beyond 100-foot radius from the nursing station. The longest traveling distance from a resident room to the nursing station is over 400 feet. In the absence of Wisconsin requirements regarding walk distance, Texas's standard may help evaluate size and scale of Silver Life. Texas requires that nursing stations must have a view to residence corridors, and the distance from a resident room to a nursing station should not be over 85 feet and

must not exceed 150 feet. The layout of Silver Life makes one residence corridor (Corridor D) invisible from the nursing stations and creates walking distance much longer than Texas' limitation.

Furthermore, approximately 85 percent of the rooms are located beyond 100-foot radius from the dining room and activity room, requiring most of the residents to walk from 100 to 300 feet for a meal or an activity.

Except dining space, the total public and social areas (an activity room, a library/chapel, an activity alcove, a waiting lounge, one family private meeting room, and two day rooms) are approximately 2898 square feet, which provides 26.3 square feet per bed for social/recreational space. If the dining space is included, there will be approximately 44.5 square feet per bed. Wisconsin requires that the period C facilities (plans approved after 1974) to provide combined floor space of dining, recreation, and activity areas more than 25 square feet per bed; the scale of Silver Life's social space outperforms that standard. From a perspective of a recent trend that require a minimum of 35 square feet per bed for social space (exclusive of dining space) (Cutler et al., 2008), Silver Life may offer much more crowded social areas (Table S-2).

Table S-2. Comparison of Silver Life's square footage per bed for social space with state-level requirements

Square footage for social/ recreational space	Silver Life	Wisconsin	A newer requirement (Cutler et al., 2008)
Inclusive of dining space	44.5	>25	n/a
Exclusive of dining space	26.3	n/a	>35

Appendix T: Analysis of Architecture Layout of Golden Age

1. Architecture layout

The architecture layout is formed by three parallel wings extending from circular double-loaded corridors (Figure T-1). The layout was analyzed using NodeXL. Results are shown in a graph (Figure T-2) and metric table (Table T-1). These analyses suggest that Golden Age has 1) no transactional area between external and internal environments and 2) a centralized layout. In general, the access to resources (e.g., the courtyard) from resident corridors requires mental and physical efforts. One resident corridor is very isolated due to little spatial connectivity with other amenities.

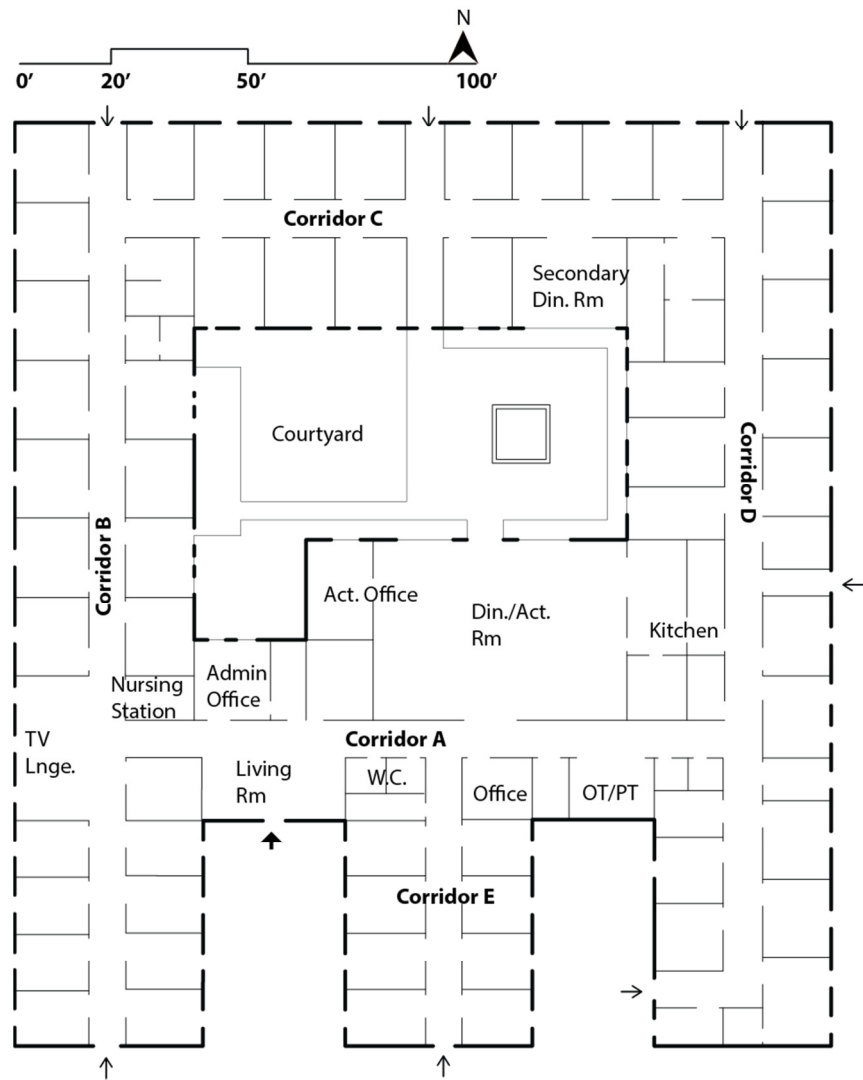


Figure T-1. Floor plan of Golden Age

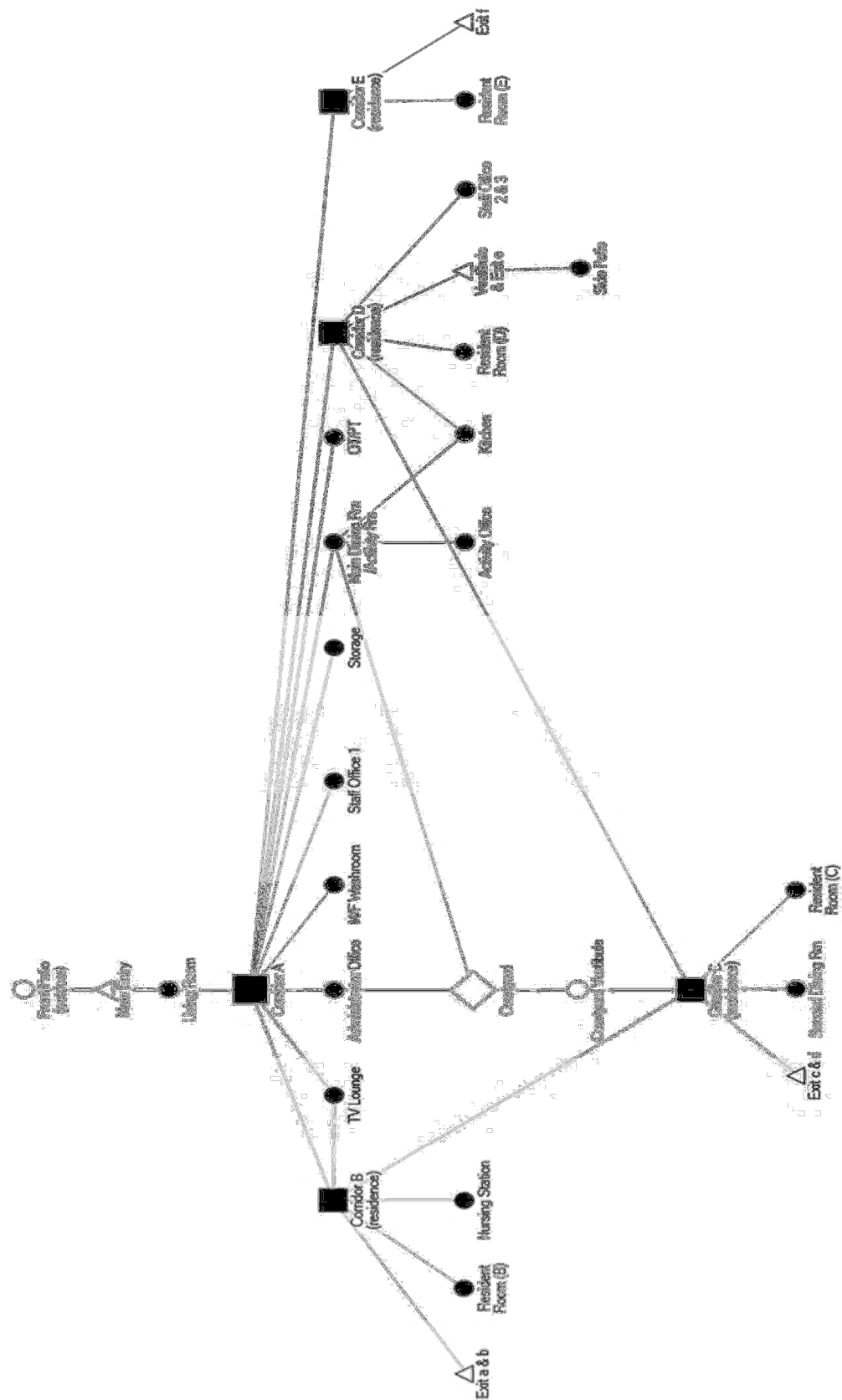


Figure T-2. Spatial network of Golden Age

Table T-1. Graph metrics of Golden Age's building layout

Location	Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality	Geodesic distance from					
					Entry	Nursing STN	Main din. /act. Rm	TV Lnge	Living RM	Court yard
Living Room	2	56.000	0.013	0.037	1	3	2	2	--	3
Corridor A	11	297.167	0.018	0.132	2	2	1	1	1	2
Corridor B (residence)	6	117.083	0.015	0.078	3	1	2	1	2	3
Corridor C (residence)	6	113.917	0.014	0.055	4	2	3	2	3	2
Corridor D (residence)	6	152.583	0.016	0.072	3	3	2	2	2	3
Corridor E (residence)	2	57.000	0.013	0.040	3	3	2	2	2	3
TV Lounge	2	0.000	0.013	0.054	3	2	2	--	2	3
Main Din. /Act. Rm	4	51.083	0.013	0.054	3	3	--	2	2	1
Courtyard	3	13.667	0.011	0.031	4	4	3	3	3	--

Living room and Corridor A:

From the floor plan and NodeXL network graph, the living room is shown as an intermediate space between the main entry and Corridor A; however, it is not used as a waiting lounge for visitors or a place to stop unexpected entries. In reality, the living room serves as a resident lounge or an activity space, that is, residents are directly exposed to visitors whose identity is not yet checked. The administrator office has a direct access to the living room and has a large window facing it so staff whoever is in the office becomes a receptionist to monitor the entry area and provides information to visitors. If there is no staff around, a resident will be the first person interacting with outsiders.

After the living room, a visitor will walk into Corridor A, which has direct links with major social areas, dining space, a therapy room and staff offices. As shown in the metric table, Corridor A has the highest value of degree (11) (11 spatial links) and various centrality measurements; it is thus very influential and important by serving as a hub of information and activities. For example, by using

Corridor A, the administrator is able to contact different departments and distribute information in a shortest way. Such layout creates centralization of information and activities, making Corridor A as a first-stop place before any event, and become the busiest section in the facility.

Resident Corridor B, C, D & E:

Four residence corridors (B, C, D & E) have high spatial depth; they are away at least three geodesic distances (three connecting paths between points in the graph) from the entry. The long geodesic distance may ensure safety and security by preventing elopement and external disturbance. The four corridors vary in access to amenities. Residents in Corridor B have easy access to social and caring resource because its direct connection with the living room space, nursing station and TV lounge. The linkage is reflected in a high value of centrality metrics, suggesting a close relationship with the center of the network and broad spatial connectivity.

Corridor D has a second highest value of graphic measurements, resulting from spatial connection with Corridor A, the kitchen, social worker's offices and an exit. To a staff member, Corridor D may work as a backstage passage way to kitchen storage closet or work space that needs higher privacy (e.g., a consulting room).

Corridor C is located deeper to the entry (four geodesic distances) and dining/activity room (three geodesic distances) than the other corridors. Since the courtyard is not used as a shortcut, residents who live in Corridor C have to travel half of the building for activity participation. One advantage of Corridor C is its easy access to the courtyard; two geodesic distances to the outdoor space may take little mental effort in navigation. Corridor E has the lowest value of overall graphic measures due to its detachment from the surrounding; residents in Corridor E have no way to access to amenities except walking into Corridor A.

Social space:

The metric table shows that the living room and TV lounge have narrow spatial connectivity (low in degree, betweenness centrality, and eigenvector centrality) and are relatively away from other places (low in closeness centrality); users of these spaces may be residents who live in close proximity like residents in Corridor B & D. On the contrary, the dining/activity room is equally located to most of the residence corridors in term of geodesic distances. It is a place to hold an activity or event that welcomes all residents. One another feature is that it has direct access to the courtyard, which facilitates residents to use outdoor space after lunch, and allows staff to integrate indoor with outdoor activities.

2. Spatial sequence, size and density

A visit of Golden Age starts at the front patio; it is located at the south of the building, facing a street in front of the facility. An automatic door leads people to its living room (31.5'x 13.7') furnished with three three-seat sofas, armchairs and a board listing activity schedules of the day. The space is constantly occupied by residents; visitors have to pass them before entering Corridor A (8'x 130') and the administrator's office. The dining room, OT/PT room and Corridor D are located at the one end of Corridor A, and the TV lounge at the other end. No information desk, map or signage indicates directions of these spaces.

The interior of the dining/activity space (55.7'x 39.6') is monotonous; it is just placed with tables, chairs and a TV; very few visual cues remind people of time, seasons or upcoming events, and very little decoration and handy resources trigger spontaneous activities. One advantage of the dining/activity space is that its glass doors and large windows bring natural lighting and outdoor views.

The activity office and kitchen stand at the west and east sides of the dining room respectively, allowing staff to monitor on-going activities and meals taking; however, it seems unavoidable that the clamor of material moving and transportation in the kitchen enters the dining space during meal time. After passing the OT/PT room (18.7' x 13.3'), one may find a much quieter residence corridor (Corridor D,

8'x 203') and a secondary dining room at intersection between Corridor D and C; it serves people who require a quiet meal environment and individual feeding assistance care. Corridor C (8'x 180') is liked with an entry vestibule of the courtyard. Most of the residents and staff members use the entry for an outdoor break.

A TV lounge (31.7'x 16.5') is located at the end of Corridor B (8'x 203'). It is furnished with a fake fireplace, TV, paintings, computer and indoor plants, showing an attempt of creating a home-like setting. The entry of Corridor E is very invisible; it is hided between washing rooms and a staff office. No sign or cue like a welcoming entry lounge guide orientation.

In this layout, length of the corridors ranges from 130 to 203 feet. Residents experience long traveling distance from resident rooms to care and activity space. Approximately 61.5 percent of the rooms (32 out of 52 bedrooms) stay beyond 100-foot radius from the nursing station. The longest traveling distance from a resident room is over 200 feet. Based on Texas's standard³⁷, the layout of Golden Age may not facilitate delivery of care due to indirect visual and physical access to residence and long walking distance. In addition, approximately 48 percent of the rooms (25 out of 52 rooms) are located beyond 100 feet from the main dining/activity room. The longest distance from a resident room is over 200 feet.

Except dining space, the total social areas are approximately 943.12 square feet, which creates approximately 11.6 square feet per resident bed for social space and recreational space. If two dining rooms (2705 square feet) are included, there is 45 square feet per resident bed, which is more than Wisconsin standard; however, from a perspective of a recent trend that require a minimum of 35 square feet per bed for social space (exclusive of dining space) (Cutler et al., 2008), Golden Age is much falling behind with square footage of social space (Table T-2).

³⁷ Since Wisconsin has no such requirement, Texas's standard may help evaluate size and scale of Golden Age. Texas requires that nursing stations must have a view to residence corridors, and the distance from a resident room to a nursing station should not be over 85 feet and must not exceed 150 feet.

Table T-2. Comparison of Golden Age's square footage per bed for social space with state-level requirements

Square footage for social & recreational space	Golden Age	Wisconsin	A newer requirement (Cutler et al., 2008)
Inclusive of dining space	45	>25	n/a
Exclusive of dining space	11.6	n/a	>35

Appendix U: Analysis of Architecture Layout of Elderly Living

1. Architecture Layout

Elderly Living separates its long-term from short-term units. The focus of this study —long-term units — is in a typical double-loaded corridor plan and encloses a trapezoid-shaped courtyard (Figure U-1). One of its corridors is splayed to insert officers, working station and utility rooms, resulting in a more complicated layout than that of Silver Life and Golden Age. As shown in the result of NodeXL analysis (Figure U-2 & Table U-1), spatial organization of Elderly Living is formed by two spatial clusters, each of which varies in its spatial depth and relations with activity and office space. More specifically, its spatial structure is characterized by 1) a long transitional area between internal and external environments, 2) a duo-core structure and 3) social space with high spatial depth. These features will be revealed in discussion of roles of six corridors and social space.

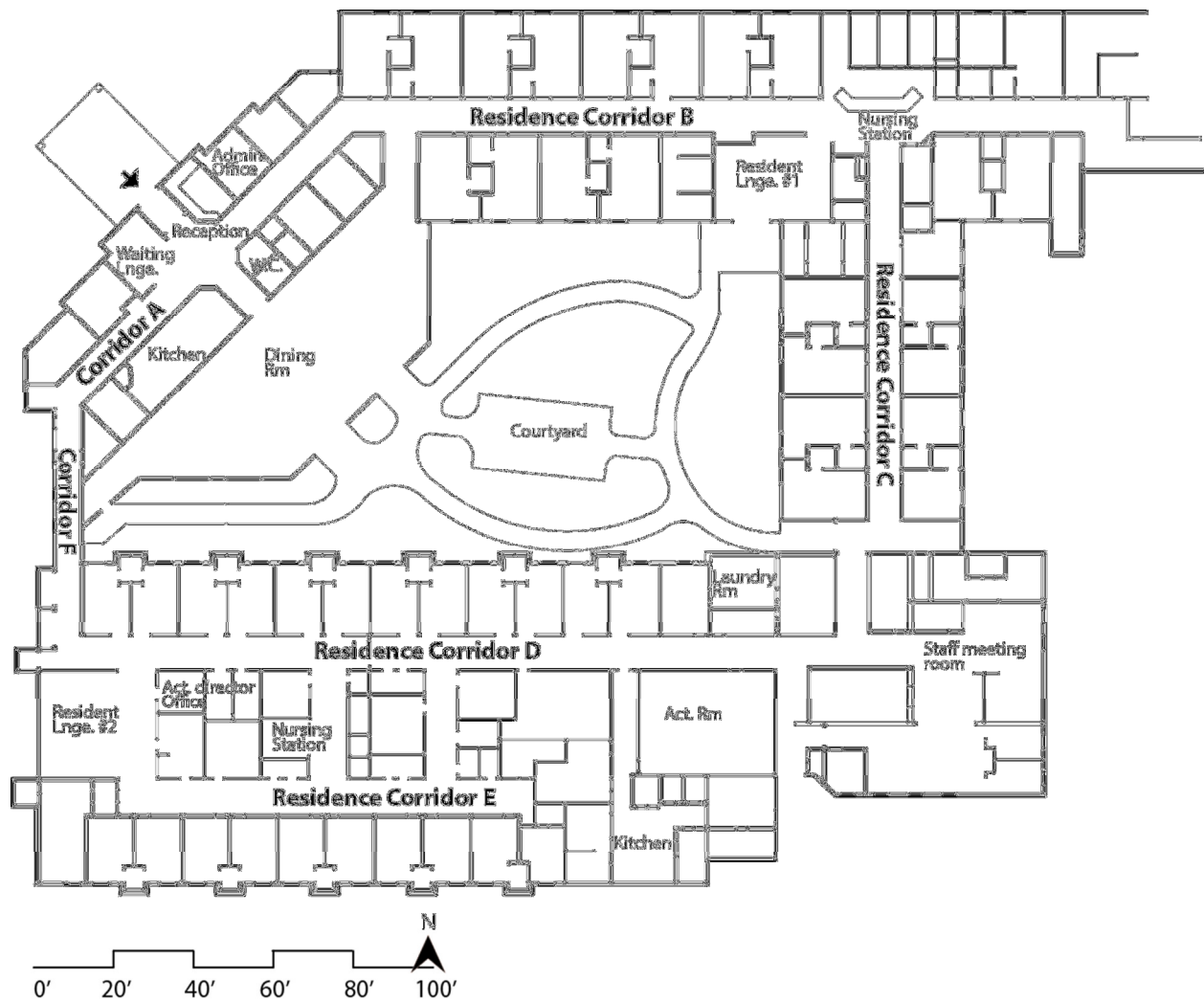


Figure U-1. Floor plan of Elderly Living

Table U-1. Graph metrics of building layout of Elderly Living

Location	Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality	Geodesic Distance from							
					Entry Rm	Din Rm	Activity Rm	Lnge 1	Lnge 2	Nursing STN 1	Nursing STN 2	Courtyard
Corridor A	8	278.000	0.012	0.035	1	2	3	2	3	2	3	3
Corridor B (residence)	6	106.000	0.011	0.031	2	3	3	1	5	1	4	2
Corridor C (residence)	4	139.500	0.011	0.049	3	3 & 4*	2	2	3	2	2	2
Corridor D (residence)	11	358.000	0.012	0.130	3	3	1	4	2	4	1	3
Corridor E (residence)	5	40.500	0.007	0.067	5	5	3	5	2	5	3	5
Corridor F	3	204.000	0.012	0.047	2	2	2	3	3	3	2	2
Lounge 1	2	13.000	0.009	0.012	3	2	4	--	6	2	5	1
Lounge 2	1	0.000	0.007	0.015	5	5	3	6	--	6	3	5
Activity Rm	1	0.000	0.009	0.033	4	4	--	5	3	5	2	4
Din Rm	4	41.500	0.008	0.013	3	--	4	1	5	4	4	1
Courtyard	4	20.500	0.008	0.016	4	1	4	1	5	3	4	--

*Three geodesic distances comes from a shortest path between the dining room and Corridor C through the courtyard; however, most of people choose a longer path (four geodesic distances) through Corridor F.

Corridor A & D:

Elderly Living's building layout makes visitors pass several "supervised" areas in Corridor A before entering residence corridors. For example, to visit residents in Corridor B, a family member has to go through an entry vestibule monitored by receptionists and pass a reception office, administrator's office and staff offices. Similarly, after the entry areas, one has to pass a staff meeting room and Corridor F to visit residents in Corridor D; the entry of Corridor D can be easily observed by the activity director; staff can further verify visitors.

As shown in Figure U-2, the layout forms two spatial clusters; the two clusters seem to be programmed as a sustainable subsystem of the facility, which has its own nearby caring and social resource. One spatial cluster is led by Corridor A, which has linkage with 1) management-level staff offices, 2) a residence corridor with its own nursing station and lounge area and 3) dining space with direct access to the courtyard. Corridor D serves as a hub in the other cluster that comprises 1) offices

and staff works stations, 2) an activity room and lounge space and 3) another residence corridor.

According to Table U-1, the two corridors are the most influential “nodes” with higher values of graphic metrics; they show a greater amount of direct and short connection with each other places, and a strong role of bridging separate parts of the buildings.

Residence Corridor B, C, D & E:

Resident corridors are located deep to the entry; they are at least three geodesic distances away from the entry except Corridor B with shorter connection. On one hand, the depth may reduce risk of elopement —residents with challenging behavior remain to stay inside. On the other hand, it may increase wayfinding difficulties for those with dementia because environments may impose a higher demand of cognitive abilities (Chang, 2002).

Corridor D is connected with the most abundant resource; residents in Corridor D have easy access to a nursing station, activity room and a resident lounge. On the contrary, Corridor E is located away from social and service spaces. Its detachment is reflected in a low value of degree and centrality metrics. Two passage ways that connect the two corridors allow Corridor E residents use facilities in Corridor D. Corridor B & C may be considered to be of secondary importance; they have a more important role in bridging different spatial groups; Corridor B connects long-term and short-term units, and Corridor C bridges the two clusters. Corridor C in particular serves as an intermediary space; it has equal geodesic distances to social space and caring stations in each of the two clusters.

Social space:

Although each of the spatial clusters includes social spaces, activities are not decentralized; residents have to travel across spatial clusters for a particular planned activity. These social spaces have narrow spatial connectivity and low centrality metrics; access to social activities becomes less flexible.

Major social space in Elderly Living includes the activity room, dining room, and two resident lounges. Except the dining room, each of them can be easily accessed from a specific residence corridor;

in such plan, residents are supposed to have less burden in traveling for activity participation. However, major activities are still hold exclusively in the activity room, which makes the attempt of providing decentralized social activities partially fail. The complicated layout creates three geodesic distances between residence corridors (Corridor B and E) and the activity room, which may increase difficulty in navigation and reduce interests in activity participation.

The dining room is also located away from the resident corridors. When there is a birthday party or music event, residents in Corridor E (with five geodesic distances to the dining room) in particular may need staff assistance to communicate between spaces.

In addition, these social spaces are isolated; they are located at the end of a corridor or between offices and thus have no way to form internal connecting loops with other areas; their low value of degree and centrality metrics indicate they are not programmed as a critical component of the layout or as intermediary space between spatial groups. The resident lounge at Corridor D (Resident lounge #2) and activity room showcases such spatial organization. One possible reason for the isolated scheme is to ensure safety; when residents leave their rooms and stay at these spaces, it is not very likely that residents take an errant trip off the site and wander around.

The lounge at Corridor B (Resident lounge #1) is an opposite example; residents through the lounge area enter into the courtyard with exits to Corridor C, A and F. From a staff perspective, it makes monitoring impossible. To make resident leave by the same door they enter, control of exits/entries become critical. It may explain why the organization installed just one automatic door and placed a heavy and hard-to-open pull-and-push door at other exists; the wheelchair automatic door may encourage residents to go out the same way they return.

2. Spatial sequence, Size and Density

An entry porch is at the northwest of the building, overseeing a drop-off area and parking lots. An automatic door leads people to a monitored vestibule. Just to the left is the receptionist's office that

has a window to control interactions with visitors. A waiting lounge (17'x 13') is opposite to the reception, furnished with sofa, armchairs and a grandfather clock. It is where staff members meet with visitors who ask for a tour. After the reception area, one will encounter an intersection between Corridor A (8'x 95.5') and path to the dining room (2873 ft²).

Residence Corridor B (8'x 190') is at the north end of the Corridor A. It has a resident lounge (22'x 30') with direct access to the courtyard. The lounge is easily monitored by a nursing station located at intersection between Corridor B and C (8'x 102'). Residence Corridor C has no nearby social space. At the joint of Corridor C and D is an entry to the courtyard; the door is heavy and is hidden between walls without views toward the outside. In Residence Corridor D (8'x 207'), the activity room (26'x 35'), kitchen, working stations, nursing stations and staff offices are lined on one side, and a resident lounge (26.7'x 25.6') stands at one end of its hallway. The lounge can be easily monitored by activity staff's office; it is decorated as a typical social space in a traditional nursing home; a big always-turned-on TV, a sofa, chairs and a big round table at the center are major features. One interesting and eye-catching feature in the lounge is a professionally-maintained bird cage that has several species of sing birds in colors.

Corridor D is connected with Corridor E by shorts passageways going through working and nursing stations. Rooms at Corridor E (8' x 100') have windows looking at driveways; residents can be easily affected by noise of vehicles. Corridor F is just a pathway linking Corridor A with Corridor D. One wall of it is decorated with facility's awards, photos, memorabilia and posters, and the other has windows facing parking lots. An entry vestibule of the dining room is located at the corridor; many behavior conflicts have been created at this place because the vestibule also has a door opening to the courtyard. Traffic jam is caused by two groups of people—people who are leaving the dining room and who are going to visit the courtyard— moving to different directions.

Except dining space, the total social and recreational area is approximately 1996 square feet in the long-term care units, which ensures 28 square feet per bed for social space (U-2). The square footage is more than what is required in Wisconsin but less than a newer expectation of a minimum of 35 square feet per bed for social space (exclusive of dining space) (Cutler et al., 2008).

Table U-2. Comparison of Elderly Living's square footage per bed for social space with state-level

Square footage for social & recreational space	Elderly Living	Wisconsin	A newer requirement (Cutler et al., 2008)
Inclusive of dining space	70	>25	n/a
Exclusive of dining space	28	n/a	>35

In the facility, there are two nursing stations for care delivery; approximately 96 percent of the bedrooms are within 100-foot walking distance from them. The longest traveling distance from a resident room is 127 feet. Based on Texas' standard³⁸, Elderly Living provides a reasonable walking distance. Unfortunately, there is only one activity room; approximately 52% of the bedrooms are located beyond 100-foot walking distance from it. The longest traveling distance from a resident room is over 300 feet.

³⁸ Texas requires that nursing stations must have a view to residence corridors, and the distance from a resident room to a nursing station should not be over 85 feet and must not exceed 150 feet.

CURRICULUM VITAE

TITLE OF DISSERTATION	Place Experience Of Nursing Home Courtyards: A Holistic Approach to Understanding Institutional Outdoor Environments	
FULL NAME	Chia-Jung Shih	
EDUCATION	Ph.D., University of Wisconsin-Milwaukee, December, 2015 Major: Architecture (Environmental Gerontology)	
	M.L.A., University of Champaign-Urbana, May, 2004 Major: Landscape Architecture	
	B.A., National Taiwan University, Taipei, Taiwan. May, 1999 Major: Science of Horticulture	
SCHOLARSHIP:	Advanced Studies Abroad Scholarship, Taiwan Ministry of Education	2009
	The Scholarship Program of Center for Aging & Community at University of Wisconsin-Milwaukee	2008
CERTIFICATE:	Graduate Certificate in Applied Gerontology, Center on Age and Community at University of Wisconsin- Milwaukee	2009
	Healthcare Garden Design Certificate of Merit at School of the Chicago Botanic Garden	2003
MEMBERSHIP	Environmental Design Research Association (EDRA) Alzheimer's Disease Association in Taiwan	
SELECTED PUBLICATIONS	Shih, C., & Yen, Y. H. (2014). Mapping Wind Comfort Areas: An Approach to Understanding Wind Conditions in a Nursing Home Courtyard. In J. A. Carney & K. Cheramie (Eds.), Proceedings of the 45th Annual Conference of the Environmental Design Research Association (pp. 181-189). New Orleans, Louisiana: The Environmental Design Research Association (EDRA).	
	Shih, C. (2013). A Study of Nursing Home Gardens: Using a Case-Study Approach to Understanding How Gardens Are Constructed in Nursing Homes. In J. Wells & E. Pavlides (Eds.), Proceedings of the 44th Annual Conference of the Environmental Design Research Association (pp. 152-162). Providence, Rhode Island: The Environmental Design Research Association (EDRA).	