

EARLY CHILDHOOD PHYSICAL ENVIRONMENT SCALES

1. Pattern 905: Spatial Organization
2. Pattern 908: Behavior Settings

The following two scales were developed to measure independent physical environmental variables. They are the principle instruments available to date for the systematic description and assessment of the quality of the physical environment of child care centers and related early childhood environments. As mentioned in the preface, we have every intention of extending these two scales into the development of a complete package of scales for the comprehensive assessment and evaluation of the physical environment of child care.

To reasonably insure construct validity for major constructs of the physical environment of child care (as presented, for example, as "patterns" in Moore et al., 1979/1994), a detailed operational definition and rating scale have been prepared for two critical patterns in child care centers, and for each level of each of these two patterns. These definitions and rating scales were informed by the work of many others (e.g., but not limited to Harms & Clifford, 1980) but were fashioned after our own Facility Inventories used for an earlier study of child care centers across the US and Canada (Cohen, Moore, & McGinty, 1978). As mentioned in the introductory essay to this report, a close inspection of the Harms and Clifford scales indicates that they deal much more with the social than the physical environment, and in fact make no distinctions between different types of physical settings. On the other hand, our own earlier inventories were too general and imprecise for the true assessment and evaluation of the physical aspects of child care. The two present scales have been called the Early Childhood Physical Environment Scales. They were first published and made available in 1982 (Moore, 1982).

Spatial Organization. The scale for Pattern 905 (from Moore et al., 1979/1994; see also Moore, Cohen, Armstrong, & McGinty, 1982) was constructed to assess the organization of the space of child care centers and other early childhood educational facilities as a whole.

The concept of open-plan school facilities was introduced to North America by Educational Facilities Laboratories in 1965. Since that time, controversy has surrounded the question of the impact of open-plan versus closed-plan buildings (i.e., not to be confused with open versus traditional educational philosophies. Most of the data have been collected at the elementary-school level (e.g., George, 1975), not child care centers, so we must be cautious about making generalizations. The findings however are mixed, with some presumed advantages being ascribed to both open and closed plan schools

(see Moore, 1983, 1987). These mixed findings leave open the question of which type of environment is better for development.

Analysis of the findings on spatial organization led me to the working hypothesis that the middle ground might be the best overall solution, that is, that what I have termed *modified open plan facilities* midway between open and closed plan might resolve the difficulties of open and closed plans while retaining their advantages (Moore et al., 1979/1994). *Modified open plan space* is the organization of space into a variety of large and small activity spaces open enough to allow children to see the play possibilities available to them while providing enough enclosure for the child to be protected from noise and visual distractions.

The scale for *modified open plan facilities* is based on ten critical dimensions of spatial organization:

1. Degree of visual connection between spaces
2. Degree of closure of spaces
3. Degree of spatial separation of one space from another
4. Degree of mixture of large open areas and smaller enclosed spaces
5. Degree of separation of staff areas from children's activity areas
6. Degree of separation of functional areas from activity areas
7. Degree of separation of different age groups
8. Degree of separation of circulation from activity spaces
9. Degree of visibility of all major activity spaces from the entry
10. Degree of connection between interior and outdoor activity areas

Each item is measured on a five-point semantic differential-type scale. If a particular center scores on average low across the ten measures, it would be considered a "closed plan facility" with clear separation between activity areas, i.e., in the vernacular, a classroom plan or an egg-crate plan. If on the other hand a center scores on average high across the ten measures, it would be considered an "open plan facility" with lack of separation among activity areas. As mentioned above, our reasoning, based on the empirical literature, has been that the middle ground of "modified open plan centers" may provide settings more conducive to both cognitive and social development than either extremes of closed plan or open plan arrangements to child care buildings (for more of this argument, and the supporting research findings, see Moore, 1982, Chapter 1; 1983a; 1987, pp. 51-53). Thus a center scoring on average right down the middle of these bipolar opposites would be assessed to be superior to centers scoring on either extreme.

Behavior Settings. The scale for Pattern 908 (from Moore et al., 1979/1994) was constructed to assess the organization and character of particular behavior settings in child care centers and other early childhood educational facilities.

In most child care centers, much of a child's time is spent in informal, unstructured learning situations -- what Barker (1968) would call *behavior settings* -- with several different children working on different projects at once, some with a teacher, some on their own or in small groups. Discussions of behavior settings generally focus more on the sociobehavioral and temporal characteristics of settings than on their physical features. Extrapolations from the limited research literature on activity settings in child care centers led me to hypothesize that architecturally well defined behavior settings might decrease classroom interruptions and contribute to longer attention spans and greater involvement with cognitive developmental activities.

Well-defined behavior settings are areas limited to one activity, but not completely cordoned off from other activities. They are sized to accommodate 2 to 5 children plus one caregiver, and typically include storage, surface areas, equipment, plug-ins, and display space for the activity. In many child care centers, and in many of the best child care settings, one behavior setting is provided for each major developmental activity (block play, arts and crafts, music, computers, nature study, quiet reading and listening, etc.). We have sometimes termed these *resource-rich activity pockets* (Moore et al., 1979/1994).

The scale for well-defined behavior settings is based on ten dimensions, each rated on a five-point, Likert-type scale:

1. Degree of spatial definition and enclosure of the behavior settings in each room or area
2. Degree of visual connections to other behavior settings
3. Degree of appropriateness of the size of behavior settings for one to four children and one adult
4. Degree of appropriateness of the amount of storage, work surfaces, and display space
5. Degree of concentration of all resources in the settings that pertain to one activity
6. Degree of softness
7. Degree of flexibility
8. Variety of seating and working positions in the behavior settings
9. Amount of resources available in the behavior settings
10. Degree of separation of behavior settings from circulation paths

Reliability and Validity. A number of methodological analyses have been carried out to quantitatively assess the reliability and validity of these two scales (reported in detail in Moore, 1982).

First, both to assess interjudge reliability and construct validity, three judges not familiar with the above hypotheses used drafts of these scales to independently rate 16 child care centers in the greater Milwaukee area in terms of both the organization of space and the

definition of behavior settings. Average percent exact agreement among the judges on the five-point rating was moderately low (52% exact agreement across all three judges, with a low of 46% between one pair of judges). Ratings, however, were for the most part in the same direction (that is, one judge rated all settings more "critically," one more "neutrally," and one more "liberally," and these differences were consistent across settings). To see if there were any significant differences between settings in terms of these ratings, paired sample *t*-tests were calculated on the average ratings for closed versus modified centers, modified versus open centers, poorly defined versus transitional settings, and transitional versus well defined settings. The settings were rated significantly differently from each other in all cases. Furthermore, as a second measure of construct validity, the ratings were always in line with the characterization given them by the principle investigator (*t*'s running from 1.97 to 4.14, *df*=59 to 119, *p*'s ranging from <.05 to <.001).

Subsequent quasi-experimental research with multiple levels of treatment and proxy pretest measures (Moore, 1986) has further buttressed the validity of the scale by showing a number of positive advantages of modified open plan types in terms of both social and cognitively oriented behaviors over either extreme (Moore, 1983a, 1987). This scale, then, may be used to measure the degree to which any particular center approximates a modified open plan type.

Further quasi-experimental research in a set of 14 child care centers in Milwaukee County selected to represent three levels of the spatial definition of behavior settings -- well defined, transitional, and poorly defined -- has provided construct validity support for the notion that the spatial definition of behavior settings is related positively to cognitive development (Moore 1983b, 1986).

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Please consider this Early Childhood Development Center and each of its primary activity spaces in terms of the following scales. Consider only the layout and character of the physical environment, not how it is or has been used by children and staff.

SCALE FOR PATTERN 905: ORGANIZATION OF THE SPACE OF THE CENTER AS A WHOLE

Please respond to the following statements by indicating your assessment of the organization of the physical environment of the entire center taken as a whole.

Name of Center: _____

	STRONG	SOME	UNDECIDED	SOME	STRONG
1. Degree of visual connection between spaces.	connection	—	—	—	Lack of connection
2. Degree of closure of spaces.	closure	—	—	—	Lack of closure
3. Degree of spatial separation of one space from another.	separation	—	—	—	Lack of separation
4. Degree of mixture of large open areas and smaller enclosed spaces.	mixture	—	—	—	Lack of mixture
5. Degree of separation of staff areas from children's activity areas.	separation	—	—	—	Lack of separation
6. Degree of separation of functional areas (e.g., kitchens) from activity areas.	separation	—	—	—	Lack of separation
7. Degree of separation of different age groups.	separation	—	—	—	Lack of separation
8. Degree of separation of circulation from activity spaces.	separation	—	—	—	Lack of separation
9. Degree of visibility of all major activity spaces from entry.	visibility	—	—	—	Lack of visibility
10. Degree of connection between indoor and outdoor activity spaces.	connection	—	—	—	Lack of connection

SCALE FOR PATTERN 908: ORGANIZATION AND CHARACTER OF INDIVIDUAL ROOMS OR AREAS

Please respond to the following statements by indicating your assessment of the organization and character of the physical environment of each room or major area.

Name/Number of Room or Area: _____

Name of Center: _____

		STRONG	SOME	UNDECIDED	SOME	STRONG
1.	Degree of spatial definition and enclosure of the activity centers in the room/area.	enclosure	—	—	—	lack of enclosure
2.	Degree of visual connections to other activity centers.	connections	—	—	—	lack of connections
3.	Degree of appropriateness of the size of activity centers for 1 to 4 children plus one adult.	appropriateness	—	—	—	lack of appropriate.
4.	Degree of appropriateness of the amount of storage, work surfaces, and display space in the centers.	appropriatenss	—	—	—	lack of appropriate.
5.	Degree of concentration of all resources in the activity centers that pertain to the activity.	concentration	—	—	—	lack of concentratic
6.	Degree of softness of the activity centers.	softness	—	—	—	lack of softness
7.	Degree of flexibility of the activity centers.	flexibility	—	—	—	lack of flexibility
8.	Variety of seating and working positions in the activity centers.	variety	—	—	—	lack of variety
9.	Amount of resources in the activity centers.	amount	—	—	—	lack of amount
10.	Degree of separation of activity centers from circulation paths between centers.	separation	—	—	—	lack of separation

* Scales developed by and copyright 1982 by Gary T. Moore based on the work of Moore, Lane, Hill, Cohen & McGinty (1979). Additional scales for other patterns of early childhood physical environments are being developed. For more information, contact the Environment-Behavior Research Institute, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee, Milwaukee, WI 53201.