Teacher stress is induced by work overload, verbal or physical aggression from students, inadequate working conditions, and lack of resources (e.g., Grayson & Alvarez, 2008; Ravichandran & Rajendran, 2007; Webb, et al. 2004; Kyriacou, 2001). Teacher stress and burnout negatively impact teacher productivity and health (e.g., Jin, Yeung, Tang & Low, 2008; Lazuras, 2006; Pillay, Goddard & Wilss, 2005; Wiley, 2000; Travers & Cooper, 1996). In the United States (U.S.) teacher turnover is costly\(^1\) and detrimental as a revolving-door phenomenon (Ingersoll, 2001) fills vacated positions with novices vulnerable to teacher stress and burnout. Teacher retention requires spatial, social, and organizational interventions, e.g., comprehensive induction programs that support novice teachers in networked and mentored learning communities (National Commission on Teaching and America’s Future, 2005; Smith & Ingersoll, 2004). Newer conceptualizations of schools as flexible and collaborative learning communities promise a better synergy between the spatial, social and organizational components of classrooms and the school which is linked to a good workplace experience for teachers (Fielding, 2006). However, teachers continue to function stressfully in many schools with older spatial and organizational configurations.

\(^1\)A National Commission on Teaching and America’s Future report (Barnes, Crowe, & Schaefer, 2007) estimates that teacher dropout costs more than $7 billion a year. A projected need for 2.8 million new teachers in the U. S. by 2016 (Hussar & Bailey, 2007) has sparked discussions about hiring and retaining effective teachers (e.g., Jacob, 2007) including second career teachers (e.g., Hasselkorn & Hammerness, 2008).
Schools contain front-stage areas (Goffman, 1959) where teachers must constantly be “onstage.” Goffman, a Canadian born sociologist (1959) conceptualized two types of areas that help regulate people’s interactions and stress resulting from those interactions - frontstage areas or ‘arenas’ in which one has to maintain a prescribed role or ‘front,’ and backstage areas in which to regroup for the next frontstage activity. Teaching can be an isolating, frontstage experience for elementary classroom teachers in older ‘turf-centric’ (Fielding, 2006) classrooms, with long student contact hours in the same room and few or no breaks. Individual and social stress-reducing strategies exist, but environmental interventions that might support these strategies spatially - for example, access to a ‘backstage’ teachers’ lounge or to ‘behind-the-scenes’ spaces of mentor teachers - have not been clearly identified. Instead, there is dissatisfaction due to a lack of such school spaces (Overbaugh, 1990), and supportive aspects of traditionally designed school spaces (e.g., Bissell, 2004) remain untapped.

The supportive stress-reducing potential of designed spaces has been successfully addressed in other areas. A paradigmatic shift from a disease-centered model to a patient-centered one supported by a strong evidence base has greatly enhanced the planning, design and management of healthcare spaces. Supportive healthcare design (Ulrich, 1991) is based on evidence that stress experienced by hospital patients is alleviated through access to nature and other positive distractions (e.g., a window looking out on a pleasant view), access to social support (e.g., proximal and comfortable waiting areas), and privacy and control with respect to their surroundings (e.g., single rooms instead of multiple occupancy rooms). These specific evidence-backed goals have resulted in layouts, finishes and furnishings that represent warmer wellness-oriented healthcare spaces instead of previous stark, clinical, disease-centered spaces.

School design is going through a similar paradigm shift. Flexible learning centers for a collaborative community of students and teachers (Nair, Fielding and Lackney, 2009) replace factory-like ‘cells and bells’ schools. Identifying stress-reducing aspects of schools will complement current learner-centered approaches and identify design interventions geared toward teacher well-being. In this chapter, the research, design and management of elementary school spaces are viewed through a dramaturgical lens. The next section reviews the background and theoretical basis for this chapter. It is followed by the results of a qualitative analysis of teachers’ self-reported experiences, and a spatial analysis of exemplary school floor plans. The chapter concludes by recommending a renewed dialog between school design researchers and practitioners using new conceptualizations and a strong evidence base.
The school as a stress-inducing workplace

School spaces create a setting for learning; they also create a primary workplace that can generate occupational stress for teachers who facilitate this learning (Johnson, 2006). Teachers’ working conditions\(^2\) include interrelated organizational, interpersonal, environmental (e.g. class size, availability of resources) and time-related (e.g., long work hours) factors that impact the onset and perception of stress. Public school teachers spend approximately “half their waking lives” in work-related activities (Wiley, 2000).

Teachers commonly experience role ambiguity and conflict, e.g., playing the role of ‘social worker’ (Sparks & Hammond, 1981), or being forced to teach outside one’s specialty area (Schwab & Iwanicki, 1982). Additionally, policy demands create a shifting ‘kaleidoscopic’ set of roles that teachers have to juggle (Valli & Buese, 2007). Low job security and incongruence between bestowed status and individual expectation (e.g. under-promotion or discrimination) are stressful hindrances to teachers’ career development (Wanberg, 1984). Due to inherent occupational stress factors, a teacher’s career, unlike other vertical occupational hierarchies, is labeled a ‘horizontal plane’ (Becker, 1952) and a ‘flattened pyramid’ (Troman & Woods, 2000). Teachers constantly negotiate and re-invent their professional identity and sense of self (e.g., Woods, Troman & Boyle, 1997; Nias, 1984).

Teachers also have to balance and maintain working relationships with students,\(^3\) colleagues\(^4\) and upper management daily. Physical working conditions (spatial, sensory

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\(^2\) School climate affects both teacher and student performance (Grayson & Alvarez, 2008; Freiberg, 1999). Teacher performance is impacted by dealing with a wide range of student abilities in the same class, having to prepare extra lessons and detailed evaluations, or encountering a higher than usual student-teacher ratio (Fimian & Santoro, 1983, Russell et. al, 1987). In the United States, recent statistics indicate a national average student-teacher ratio of 15.4 students per public school teacher (Institute of Education Sciences, 2007).

\(^3\) Teachers constantly feel responsible for the behavior of students (Brenner et. al, 1985). Student behavior is stress-inducing when characterized by violence (Wanberg, 1984), aggression or disruption. Cumulative effects of constant ‘low-level’ disruptive student behavior on teachers are also found more stressful than single disruptive incidents (Kyriacou, 1987).

\(^4\) Relationships with colleagues can either be a source of stress or support depending on their quality (Brenner et. al. 1985) and to the extent that values are shared (Nias, 1984). Although seeking and maintaining supportive collegial interaction involves effort and time (e.g., Nias, 1984) it is associated with reduced stress (Jarzabkowski, 2002) and positive outcomes. For teachers with family commitments, family relationships occasionally provided social support (Cooke & Rousseau, 1984). In contrast, juggling family and work demands created conflicts and spillover (influence of one domain on another, e.g., having a sick child at home and pressing priorities at work at the same time) especially in families with working spouses (Ross & Altmair, 1994). Conflicts with leadership styles can also result in strained relationships with people in management.
and maintenance factors) also impact teachers’ experiences. Hanushek, Kain and Rivkin (2004, p. 330) found that “teachers may be willing to take lower salaries in exchange for better working conditions.” Spatial factors included lack of space or its arrangement\textsuperscript{5}, layout and placement within the school. A lack of staff and storage resources (Connors, 1983) and large class sizes (French, 1993) negatively influence teachers’ effectiveness. Chaudhury, Hammer, Kremer, Muralidharan, & Rogers (2006) recorded higher teacher absenteeism in primary (elementary) schools with poorer working conditions (e.g., lack of toilets, uncovered classrooms, no electricity). Schneider (2003) found that poor environmental conditions such as bad indoor air quality, inadequate lighting, dirty common spaces (lunchrooms, restrooms) and inadequate classroom spaces were linked with poor teacher health outcomes (e.g. asthma and sinus infections) and teacher attrition. Buckley, Schneider and Shang (2005) found that school facility quality (as reflected in the age and level of maintenance) affected teacher retention/attrition even after controlling for other factors.

Thus, school spaces have been mainly established as stress-inducing workplaces for most teachers with organizational, interpersonal and physical design antecedents; their stress-reducing aspects have not been examined yet. The next section frames stress-inducing and stress-reducing aspects of teachers’ workplaces using two theoretical ideas: Lawton and Nahemow’s adaptation level theory and Goffman’s dramaturgical theory.

### Theoretical premise: Stress-reducing school spaces

The adaptation level theory (Lawton & Nahemow, 1973) helps conceptualize stress-inducing teacher experiences and proactive stress-reduction teacher efforts in school spaces using two ideas: 1) *competence*, or an individual’s functional ability to “respond adaptively, as judged by social norms, in the domains of physical health, activities of daily living, sensorimotor and perceptual functions, and cognition” (Lawton, 1989, p. 59); and 2) *environmental press*, or the demands placed by the socio-physical context. Favorable behavioral and affective outcomes occur when there is a good match between personal competence and environmental press. A theoretical line called the *adaptation level* (Figure 1) represents a set of good correspondences

\textsuperscript{5} Open plan schools include acoustic concerns - noise stress in the classroom results in teachers restricting their activities for fear of adding to noise (Kyzar, 1971 cf. Ahrentzen et. al., 1982).
between competence and press levels. A slight increase in press level (in the zone of maximum performance potential) stimulates and provides a manageable challenge to the individual and a slight decrease (in the zone of maximum comfort) provides a state of enjoyable mild dependence.

![Lawton and Nahemow's ecological model](image)

Figure 1: Lawton and Nahemow’s ecological model

Depending on a teacher’s competence levels, environmental press in the school can be perceived as exciting or debilitating. Stress, “signifying an imbalance between environmental opportunities and individual’s goals, and capabilities to cope with that imbalance” (Evans & Cohen, 1987 p. 573) occurs when the correspondence between a teacher’s competence and the school’s press deviates from the adaptation level. Experiences in high-press school spaces could be stress-inducing, and consequently experiences in low-press school spaces could be stress-reducing. Identifying spatial resources is an important step in developing supportive environmental interventions in schools.

High-press and low-press school spaces can be conceptualized as frontstage and backstage areas using Goffman’s dramaturgical theory. The ‘performance’ is given in a frontstage area; for example, the classroom in which the performer (teacher) is bound by role expectations and standards for acceptable behavior. A backstage area is
where the performer can relax and “step out of character” because audience members are not expected to intrude in this space, e.g., a teachers’ lounge (Ben-Peretz and Schonmann, 2000). Goffman (1959, p. 113) writes, “Very commonly the back region of a performance is located in one end of the place where the performance is presented, being cut off from it by a partition and guarded passageway.” There are two spatial relationships relevant to this chapter: 1) physical proximity between frontstage and backstage areas; and 2) the control of backstage areas that “plays a significant role in the process of ‘work control’ whereby individuals attempt to buffer themselves from the deterministic demands that surround them” (Goffman, 1959, p. 114). High-press experiences in frontstage areas might cause teacher stress (deviation from the adaptation level), and low-press experiences in backstage areas might reduce teacher stress and help restore balance. In instructional spaces, low-press experiences are dependent upon non-teaching moments, absence of children, and availability of stress-reducing conditions, e.g., access to proximal, suitably partitioned, backstage areas like a teachers’ lounge.

This chapter presents findings from two studies: 1) a qualitative analysis of teachers’ daily experiences in school spaces to locate stress-inducing factors and stress-reducing spaces, and 2) a spatial floor plan analysis of exemplary schools to explore the location and relationship between backstage and frontstage areas.

### Teachers’ daily experiences in school spaces

Teachers’ experiences were explored in a two phased study (see Table 1) using a cross-sectional survey and in-depth interviews (Betrabet Gulwadi, 2006). Qualitative data analysis techniques (Miles & Huberman, 1994) used comparative data matrices of teachers’ responses to open-ended survey and interview questions to answer - what stress-inducing factors and stress-reducing school spaces feature in teachers’ daily school experiences?

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6 Teachers’ responses were coded using a simple system that clustered conceptually similar items together (open coding; Strauss & Corbin, 1998). Several iterations of data organization placed each within the most suitable cluster or category. Codes were later assembled into higher-level abstract codes linked to key concepts in the study (axial coding; Strauss & Corbin, 1998). Two independent reviewers checked codes for consistency and clarity at two points during the open coding and the axial coding on the basis of face validity.
Stress-inducing factors

Stress-inducing factors included 1) absence of compatibility and control, and 2) a need for role relinquishment. These factors are represented below using teachers’ direct quotes, referenced by the survey respondent or interviewee number (#) assigned to the survey or interview.

Absence of compatibility and control

Teachers’ responses indicated a lack of compatibility between personal goals and environmental opportunities, and a lack of control with respect to their surroundings. Contributing factors included inadequacy of resources, unsuitable environmental conditions, and inability to meet personal needs.

Not having adequate resources for necessary and purposive action as a teacher is evident - “lack of basic resources, paper, pencils, broken copy machine, no markers, glue, scissors....”(Single female survey respondent #40, age range 30-39, 4 years teaching experience). Teachers often used their own funds, sought free resources (art teacher with limited funds) or other funding sources - thus draining their money and/or time. One teacher found this stress-inducing: “not having what you need is very stressful – it takes extra time and money to develop resources – that’s more stress.”(Married female survey respondent #31, age range 40-49, 4 years teaching experience). A special education teacher with insufficient learning materials for her students found herself “having to photocopy everything I use because I do not have enough books for my students” (Single female survey respondent #50, age range 30-39, 3 years teaching experience). A novice teacher realized she often had to “purchase classroom supplies because of lack of response from administration for items such as chalk, pencils, erasers for chalkboard etc.” (Single female survey respondent #67, age range 20-29, 1 year teaching experience). It was no different for a veteran teacher: “I just buy what we don’t have” except - “we have no playground and I can’t buy one of those” (Married female survey respondent #63, age range 50-59, 30 years teaching experience). Another veteran teacher indicated, “to implement programs or materials, we are constantly searching for funds by writing grants, requesting help from other resources.” Fund-raising is time-consuming and it is a challenge to get the most from the time invested (Single female survey respondent #25, age range 40-49, 22 years teaching experience) These quotes demonstrate teachers’ proactive stress-reduction efforts to overcome environmental demands and reach closer to the adaptation level.
<table>
<thead>
<tr>
<th>Sample and recruitment</th>
<th>Number obtained</th>
<th>Instrument</th>
<th>Sample characteristics</th>
<th>Data analysis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross sectional survey</td>
<td>Teachers in public elementary schools in Chicago, IL</td>
<td>71</td>
<td>Seven page questionnaire + follow up after three weeks.</td>
<td>Average age range (40-49 years)</td>
<td>Ratings of frequency of stress and coping strategies were summarized as frequencies and tabulated into high, medium, and low scores to enable comparison between groups; those findings are discussed in more detail in Betrabet Gulwadi (2006)</td>
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<td>Five hundred questionnaires were mailed with monthly newsletters of the Chicago Teachers Union and the Chicago Public Schools, handed out at teacher meetings in schools, distributed to teachers via referrals, and placed in teachers' mailboxes in different public elementary schools in the Chicago area.</td>
<td></td>
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<td>Main themes related to why teachers seek restoration:</td>
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<td>- Need for compatibility and control</td>
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Items:
- demographics, sources of stress, frequency of use of coping strategies, and open-ended questions on stress-inducing factors, environmental competence (awareness and use of individual and environmental coping resources)
<table>
<thead>
<tr>
<th>Results</th>
<th>Need for role relinquishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data analysis</td>
<td>In-depth interviews</td>
</tr>
<tr>
<td>Sample characteristics</td>
<td>75% full-time sole teachers in classrooms averaging 24 students each</td>
</tr>
<tr>
<td></td>
<td>62% lived with a spouse/partner</td>
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<td></td>
<td>53% were parents caring for their children at home</td>
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<tr>
<td></td>
<td>Others: special education, art, or physical education teachers</td>
</tr>
<tr>
<td>Instrument</td>
<td>Semi-structured interview guide</td>
</tr>
<tr>
<td>Number obtained</td>
<td>9</td>
</tr>
<tr>
<td>Sample and recruitment</td>
<td>Subset of those who responded in the questionnaire and provided their contact information. There was no identifier that linked them back to their original questionnaire</td>
</tr>
<tr>
<td></td>
<td>Worked in different schools in Chicago</td>
</tr>
<tr>
<td></td>
<td>Content analysis of responses</td>
</tr>
</tbody>
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Table 1: Study Methodology
Unsuitable environmental conditions encountered daily create a lack of compatibility with the environment; thermal comfort is a common disruptive environmental concern. One teacher wrote that she and her students were either too cold or too warm in their classroom which also had unreliable lighting - “some lights would go out and come back on after 5-10 minutes constantly and some sections would never light” (Married female survey respondent #68, age range 40-49, 27 years teaching experience). Another teacher found it stress-inducing because of “…..no air-conditioning in the summer … in a 105°F classroom” (Single female survey respondent #32, age range 30-39, 10 years teaching experience). One classroom had no window blinds and was at temperature extremes of 96°F or 56°F and the situation worsened when “…building windows do not open” (Single female survey respondent #40, age range 30-39, 4 years teaching experience) or when repair and maintenance efforts create further interruptions, “I have to share my classroom with the school engineer who is constantly interrupting my class” (Single female survey respondent #50, age range 30-39, 3 years teaching experience).

Lack of instructional space is stress-inducing. For example, a special education teacher reported that she had to either share a room with others or not have a classroom to work in. Another teacher expressed: “At one point I was moved to a classroom that had been a repository for broken furniture and old books. And the first 6 months we had to shove broken furniture aside to have little space for ourselves. By the next year we were able to get rid of the debris… it was such a filthy room. …but it is very hard for me to be in an environment where I have no control and if I see things that I very much want to change and I cannot change. It is stress producing.” (Interviewee 6)

Stephen Kaplan, a U.S. environmental psychologist (1983), has suggested that the sense of “things being under control” is quite different from a personal sense of “having control.” Having control over the surroundings is a required aspect of being a teacher, that is, keeping the class under control or keeping the classroom structured and organized. However, when some of the basic environmental conditions do not function as they should, a sense of things being under control (e.g., a smoothly operating physical school setting) and a sense of being in control (i.e., ability to control temperature) are both threatened, perpetuating stress. Other stress-inducing experiences were related to teachers’ inability to fulfill their personal needs. Few opportunities for restroom (toilet) breaks are expressed by both classroom and special education teachers; one talked about her experience in a “very structured rigid school that I have been in the last 20 years. We were not allowed to leave the classroom. So,
it was me and eight children, all day long other than to let them go to the gym or to the library” (Interviewee 6). Another frustrated teacher wrote, “Since school began on August 25 until today August 30, I was only given 2 breaks in that period. I told the principal and vice-principal and they don’t see to it. Also, I was not able to go to the bathroom all day because they couldn’t find the keys to the new bathroom!” (Single female survey respondent #12, age range 40-49, 9 years teaching experience).

Because classroom teachers are responsible for their students, even scheduled breaks are sometimes compromised; “It’s stressful — not being able to go to the bathroom when I need to go to the bathroom - today that happened...I had no break at all from 7.50 a.m to 12.40 p.m. and generally I get a break at 12 because the children go out to recess but it rained, so I had no break and you know I survived I managed to make it through — but it’s stressful” (Interviewee 4). This teacher also observed, “I would probably venture to say that teachers as a group are more sick than other professions ...first of all they can’t just get up and take care of needs - they can’t just leave children. So I know so many teachers who have bladder infections all the time.” Some teachers attempted to regain control by approaching the principal about personal needs, “I told my principal that we should have a meditation room for “restorative” purposes. He laughed. Then I mentioned it again and said other people would like it too. He just laughed. I’m serious!” (Single female survey respondent #12, age range 40-49, 9 years teaching experience).

In sum, stress-inducing factors such as inadequate resources, unsuitable environmental conditions and inability to attend to personal needs created a lack of teachers’ compatibility with the environment and a loss of control over it.

**A need for role relinquishment:**

A teacher’s role is demanding and multifaceted, requiring intellectual, emotional and physical strength and resilience. An elementary classroom teacher not only facilitates learning; a first grade teacher felt that she did a lot of babysitting and that “days when I feel most stressed out are days when I had a hard time keeping the kids’ attention and getting anything done…” (Interviewee 5). A fourth grade teacher expected parents to participate in their child’s learning. She felt, “When the parents don’t give the kind of attention, the child takes the work home and it comes back the next day without ever having left the book bag, you know, it’s extremely stressful. I’m having to fulfill the role of parent even though I’m not there at the house. I can’t be a parent to every child
— I have no right to do that, it is not humanly possible, so it’s frustrating” (Interviewee 3). Another felt that a teacher’s role has changed, “…teachers used to be the knower of knowledge - most certainly that’s not our role not anymore. I think that the role is now that we have to teach the children how to access themselves, how to get to what you need to solve that problem... so my role is changing to let’s say dialectic, to more of a facilitator and moving out of one role into another.” (Interviewee 3). All these roles: baby-sitter, surrogate parent, educator, facilitator, are folded into a teacher’s daily frontstage experience.

Stress-reducing spaces sought by teachers

The following open-ended questions were asked in the survey: “Name a place/ places or things that help in making you feel better when you are stressed out or exhausted – when you seek solace or need to lift your spirits,” “What happens there/ then to make you feel better?” and, “What things in the environment are absolutely essential to making you feel better?” For each question, teachers could give as many responses as they wished or none at all. Teachers’ responses were coded using open and axial coding (as described earlier) to yield lists of places and environmental conditions. Teachers chose the following stress-reducing places: home, nature-related outdoor places (e.g., lakefront), city places (e.g., museum), third places (e.g., café) and church. School spaces were conspicuously absent. Ambient aspects not specifically linked with a place but highly regarded for the experiential quality were sensory conditions (e.g. pleasant sounds such as music and laughter), social contact, props (e.g. books), and nature-related environmental features (e.g. plants).

Within the school, lack of a suitable backstage area such as a teacher’s lounge or a getaway space influenced teachers’ stress-reducing attempts. This finding was probed further in the interviews. One teacher described her situation thus: “I try to go find other teachers to talk to - schools are not geared towards that... we go into our room and close the door but we don’t have a lot of interaction naturally - so we have to go look for it, invite people into your room, go to their room, its difficult to do that - you know - there isn’t the time. (Interviewee 1).Therefore, interactions often occur in corridors or hallways, e.g., “if I were speaking with another teacher at work we would be speaking in the hallway outside of our classroom doors or the school lunch room.” When asked if a teachers’ lounge would assist in stress-reduction, she commented: “I’ve not been in schools where teacher lounges are conducive to rest, rejuvenation; they are very busy places, people are talking all the time” (Interviewee 6). Another
teacher remarked that having a teachers’ lounge in the school does not necessarily ensure her easy access and use of it; “We have a teachers’ lounge but I never go there. It is nicer than at most schools - it has carpeting, it has a refrigerator, a microwave but it is not a very warm comfortable place. I’d rather stay in my classroom or go outside where there are benches. For me, it is far from my classroom, (my classroom is on the first floor and the teachers lounge is on the second floor), it is not centrally located and there’s always people in there and there’s always talking - so if I want to go there for quiet... At our school no one uses it because it takes too long to get there and then there’s not a lot of free time so we don’t go there and don’t interact much.” (Interviewee 1)

Thus, having a lounge is not quite the answer, but having it nearby and accessible seems more important, especially if it were to serve as the backstage function. Another issue is the time needed to access it. A teacher’s decision to stay in her classroom rather than use the teacher’s lounge is influenced by availability of time: “All the kids eat on the third floor and the teachers lounge is on the first floor. I have twenty minutes to eat. I never go to the teachers lounge. So I think a smart idea is if you want your teachers to be on time picking up the kids (after lunch) put the teachers lounge right next to the cafeteria.” (Interviewee 8). Another aspect is the physical appearance, attractiveness and cleanliness of the lounge. “It is not only disgusting down there; there is one person in our building who has claimed it for himself and this person is not friendly and not nice.” (Interviewee 8). “The teachers’ lounge changes every couple of months where it is in the building. There is no place in the building that I can go to be alone except in the bathroom, that’s it and there is no other place - which is hard, and there’s no beautiful place.” (Interviewee 9)

Why does there have to be a getaway place or backstage area? The teacher explained: “It is like the difference between being on vacation at home and being on vacation somewhere else. When you are on vacation at home, you still look around and you see the laundry and the dishes, it’s like wherever you look. And I am very sensitive to what I see. I can’t — its hard for me to cut out what’s around that could be done. So it takes me going in this room at home. There’s still stuff there, but I keep it very orderly and very, you know, simple as I can and that helps me because otherwise I would be seeing all the work — this pile has to be dealt with, this mail has to be.... but in the school there is no such place.” (Interviewee 9)
Therefore, it is not just the physical access to a school backstage area, but its organizational support and experiential qualities that influence teachers' attempts to pursue a few ‘offstage’ quiet moments and escape from visible work reminders during the schoolday. This is not afforded in most current teachers’ lounges that instead serve as lunch/work rooms, often housing the copier and other amenities (e.g., Lackney, 1996). So, are school spaces capable of providing adequate and accessible backstage areas? The following section presents a spatial analysis of newer schools to explore the location and accessibility of backstage areas.

**Spatial floor plan analysis of exemplary schools**

The concepts of frontstage and backstage areas were explored with annotations in floor plans of seven award-winning elementary schools profiled on the DesignShare website, www.designshare.com, over the past six years (Figures 2 through 7). Only clearly labeled plans of elementary schools in the United States were selected. A floor plan analysis is limited because it does not address issues like the volume of spaces, their maintenance, and building condition. It also does not reveal organizational factors (such as those mentioned in the earlier section) that might influence the use of the school spaces. However, it helps illustrate the spatial concepts discussed in this chapter and provides a preliminary glimpse of the potential impact of spatial configuration on teachers’ school experiences. Annotations were based on the following considerations gleaned from the theoretical basis mentioned earlier:

- Backstage areas are separated by partitions and guarded passageways
- They are proximal to frontstage (instructional areas) and accessed relatively easily
- They are at one end of the frontstage performance space
- Only performers have access to these areas (e.g., other teachers/staff)

Spaces labeled for teacher use (e.g. faculty lounge, teacher prep) in plan were examined to see if they met these considerations. Also, the availability of any spaces with potential as backstages because of the spatial layout was also documented. As the floor plans demonstrate, school designs are undergoing a transformation - new concepts in spatial configuration are generating Main Street spines, storefronts, discovery centers, and flexible, technology-enhanced environments. The learning community approach (Nair, Fielding, Lackney, 2009) creates a different kind of frontstage area
for the teachers in each pod or community when compared with traditional factory model classroom plans. The nine floor plans demonstrate a variety of configurations with varying visual and physical access to backstage spaces. Some backstage areas are successfully partitioned from surrounding and frontstage areas, and some are even accessed through a ‘guarded’ passageway. Although these plans reflect the newer philosophy and cannot be directly related to teacher experiences mentioned earlier, these spatial relationships create hypotheses and raise questions for future research.

Figure 2: Atrium School

Figure 3: West Haven Elementary School
Figure 4: Santa Rita School

Santa Rita School
Los Altos, California
Gelfand Partners Architects (formerly Gelfand RNP)

- Kindergarten - 8th grade
- Open, spacious, accessible
- Natural, sustainable design principles
- (reprinted with permission from Gelfand Partners Architects)

Teachers' lounge - relatively proximal to frontstage classroom areas and accessed easily – has two doors and direct access to the outside.

Backstage area is at one end of the main performance spaces (i.e., classrooms).

Figure 5: Trailside Elementary School

Trailside Elementary School
Park City, Utah
VCBO Architecture, LLC

- Kindergarten - 6th grade
- Collaboration in teaching and learning
- Smaller clusters of classrooms
- (reprinted with permission from VCBO Architecture, LLC)

Because of proximity and visual access from corridor, teachers may or may not have exclusive access.

Backstage area is directly accessed off from the main cluster – but may have visual access as indicated by plan (glazing?)

Teacher prep areas located in each cluster can serve as backstage areas.
Figure 6: McWillie Elementary School

Figure 7: Moreland Hills Elementary School
The need to hire and retain more teachers is a pressing consideration in U.S. schools. Stress contributes to teacher attrition, high turnover rates, and high retention and recruitment costs. This chapter conceptualized teachers’ stress-inducing experiences in frontstage areas as deviations from an adaptation level, and stress-reducing experiences in backstage areas as opportunities to restore balance. Self-reported stress-inducing experiences of teachers point out that inadequate space, time and funding resources and poor working conditions create a lack of compatibility and control, and a need for role relinquishment. Teachers’ responses indicate that they proactively try to restore the balance (e.g., buying resources, seeking social support in hallways) and sometimes fail (e.g., unable to relinquish role, unable to find a suitable backstage space). Stress-reducing spaces identified by teachers include other places in the community and their homes, but none within the school.

Through a dramaturgical lens, teachers’ instructional activities mostly play out as frontstage behavior - in the classrooms, hallways or other instructional spaces. There are few opportunities for backstage moments - either when students are not in the room, or before and after the school day - when teachers can be out of students’ sight and could “step out of character.” There is a lack of non-instructional support spaces exclusively for teacher use, e.g., a teacher’s lounge - that could serve as a backstage area. Backstage moments are necessary for buffering the effects of stress and to enable teachers to restore balance and move towards the adaptation level. While they may not directly alleviate stress-inducing aspects, they might provide the necessary pause in the school day. The floor plan analysis of newer schools indicated that there is potential for designing suitable backstage areas.

Many questions emerge: How are restorative backstage moments supported by the existing physical and organizational environment? Do stress-inducing features render a school’s stress-reducing potential invisible? Teachers who participated in the survey and interviews found that their school lounges exacerbated their stress. Would a well-designed and suitably located teachers’ lounge enable backstage reflection and restoration? What would the design features of such a backstage space represent? Are the lounges in the exemplary schools helping to alleviate stress experienced by teachers? Making such questions a future research focus could yield meaningful stress-reducing environmental interventions in schools.
This chapter provides a new lens to examine all kinds of old and new school spaces to assess how they might support teachers’ functional and restorative needs. Opportunities and constraints identified in the annotated floor plans can be used as hypotheses in future school research. The evolution of school philosophy and the corresponding evolution in school architecture closely parallels the evolution of healthcare design from a disease-treatment model to a patient-centered model. Newer healthcare settings informed by a strong evidence base are sensitive to stress-reducing needs of all those who experience them (patients, nurses, family members) and create spaces that are easily accessed, distract positively from stress with nature or artwork, and provide an overall humane experience. Moreover, distinct cost benefits have been associated with better patient discharge rates and higher productivity of staff.

As school design shifts from a sage-on-stage factory model to a collaborative learning-community model, the underlying fact is that the ‘stage’ has not been obliterated - it has been expanded with new dimensions. Teachers may still need a backstage area in their school in which they can step out of character periodically. However, we need a strong evidence base - similar to the one in healthcare environments - that can inform design decisions more holistically and convincingly. Seeking ways to reconceptualize schools as having stress-reducing components in addition to stress-inducing ones, this chapter adds to the dialog that school designers and researchers will need for creating productive and healthy schools in the future.
References


