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The Effect of the Servicescape on Service Workers

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Although studies have provided evidence that characteristics of the physical environment (servicescape) affect employees' attitudes (e.g., job satisfaction), these studies were limited in the scope of the characteristics they examined. Furthermore, they did not delineate the processes through which (a) the servicescape affects the attitudes and (b) the attitudes generate outcomes beneficial to service firms. Specifically, this research considered the effects of three elements of the servicescape (pleasantness, safety, and convenience) upon service workers' job stress and job satisfaction and, subsequently, their commitment to the organization and referral intentions. The authors developed a model to embody these processes and tested this model by conducting a quasi-experiment with longitudinal data from nurses working in a hospital that added a new wing to its existing facility. Their analysis of responses from the nurses supports the model, and they suggest implications for service firms in managing the servicescape.

Keywords: *servicescape; service workers; job satisfaction; job stress; commitment; referral intentions*

Because of the simultaneous production and consumption of most services, an organization's physical

facility—its servicescape—can play an important role in the service experience (Bitner 1990, 1992). Yet the impact of the built environment on its users is not fully understood (Bitner 1992). We believe that understanding the effects of user perceptions of a service facility's design features is beneficial. The places customers visit (e.g., restaurants, repair shops, supermarkets, clinics) are part of their consumption experiences. Likewise, the places employees work are part of their experiences. Indeed, employees commonly spend more time in service facilities than customers. Customers leave after transactions; service providers typically do not.

In inseparable, interactive services, providers' emotional states and readiness to serve clearly affect customers' experiences with the service. In what is known as "linkage research" (Wiley 1996), the employee-customer interaction forms the basis for the hypothesis that what employees experience in the workplace is correlated with the experiences they create for customers (Oliver 1997; Schneider et al. 2005). Thus, satisfying service providers precedes satisfying customers. Many issues can influence employee satisfaction, including perceived pay equity, teamwork, and the quality of supervision. However, management of the physical setting is a resource that many organizations barely tap, and it is often considered less important than other motivational variables, such as pay and supervisor

support (Becker 1981; Bitner 1992). Can the facility where service work is performed affect employees' satisfaction in meaningful ways? We conducted the research reported in this article to provide initial insights and stimulate more in-depth research on the issue.

Service roles differ dramatically in what is required of the people who perform them and the environmental conditions under which they work. Gardeners and air traffic controllers both fit the classification of "service worker," but their job requirements and the amount of time they spend in specific work areas are quite different. We wanted to study a challenging service job performed in a single facility to explore the facility's impact. Thus, we chose to study hospital nurses, who work long shifts in demanding service roles. Also, it is timely to study the servicescape in this context. Health care construction is expected to rise to nearly \$54 billion by 2010 (FMI 2006).

We secured the cooperation of a hospital that was adding a new wing to its existing building, which enabled us to study the influence of the facility on nurses both before the new wing opened and afterward. In addition, we were able to compare the perceptions of nurses who moved to the new wing with those who remained in the original facility. We conducted a longitudinal quasi-experiment in a natural setting to examine how features of the servicescape could affect service workers' job stress and job satisfaction (Cook and Campbell 1979). Our findings provide preliminary evidence that highlights the important perceptual dimensions of the servicescape that need to be considered in its design. Our article also demonstrates and explains the process through which these dimensions affect employees' behavioral outcomes and differentiates the roles of the dimensions in this process.

With this article, we seek to make both conceptual and empirical contributions to the service research literature. First, we propose the concept of service provider experience. We then present a model of the influence of the servicescape on people performing demanding service work and describe the results of testing this conceptual model in a three-phase, longitudinal study of hospital nurses. We conclude with a discussion of our findings and suggestions for further research.

SERVICE PROVIDER EXPERIENCE

Customer service experience is defined as "the service encounter and/or service process that creates the customer's cognitive, emotional and behavioral responses which result in a mental mark, a memory" (Edvardsson 2005, p. 129). Researchers acknowledge that satisfying the needs of employees enhances a firm's ability to meet customers' needs (e.g., Schlesinger and Heskett 1991;

Schneider and Bowen 1985), which in turn improves customers' service experiences. Several researchers note that the service encounter also affects employees (e.g., Bitner, Booms, and Mohr 1994; Lewis and Entwistle 1990; Price, Arnould, and Tierney 1995), but most research has focused on implications of the service encounter for the recipient of the service rather than for the provider. Our focus in this study was on the service experiences of providers.

We define service provider experience as the cognitive, emotional, and behavioral responses that are created during the process of performing in a service role. The term *experience* has multiple meanings. We use the term to convey what occurs in the work role ("the supervisor criticized Joan") rather than accumulated knowledge ("Joan is an experienced employee"). As we conceptualize it, service provider experience can be evaluated along two dimensions: the service worker's "immersion" in the service place and the "intensity" of the service role. We created these constructs to help us understand the complexity of service provider experience. We define experience immersion as the time a worker spends in a specific workplace. Some workers are assigned to defined work areas for long periods, while others may "float" to different work areas and/or work brief shifts. We define experience intensity as the amount of knowledge and skill, emotional labor, and/or physical labor required by a service role. Jobs vary in terms of labor intensity and required knowledge and skill. The service place and the service role are important components of service provider experience.

Service Place

Literature assessing the influence of specific physical design features on facility users can be found in multiple disciplines, including environmental psychology, organizational behavior, marketing, and medicine. Research in environmental psychology has considered the influence of the physical environment on social interactions (e.g., Barker 1968; Bennett and Bennett 1970), cognition (e.g., Rapoport 1982), emotion (e.g., Mehrabian and Russell 1974; Russell and Pratt 1980), and physiology (e.g., Oborn 1987; Riley and Cochran 1984). Researchers also have considered the effects of specific environmental features, such as lighting and music, and specific types of environments, such as private residences and hospitals. This research consistently shows that the environment can influence the behavior of its users (Rapoport 1982; Russell and Ward 1982).

Most of the research in marketing draws from environmental psychology theories to examine the physical environment's impact on customers (e.g., Donovan and Rossiter 1982; Kotler 1973; Wall and Berry 2007). These customer-centered studies have considered the effects of

music (e.g., Milliman 1982), colors (e.g., Bellizzi and Hite 1992), and olfactory cues (e.g., Bone and Ellen 1999; Spangenberg, Crowley, and Henderson 1996), among other variables. Bitner (1990, 1992) and Baker, Berry, and Parasuraman (1988) are among the few marketing researchers to consider the influence of design features on employee attitudes and behaviors.

Many of the studies on the physical environment's influence on employees are in the organizational behavior literature. This literature reveals the physical environment's influence on employee performance and satisfaction in office and factory settings (Sundstrom and Sundstrom 1986; Wineman 1982). In a review article, Wineman (1982) found that environmental factors, such as workspace design and ambient conditions, are critical to employee productivity and satisfaction.

Most of the research in health care has focused on the relationship of hospital design to patient outcomes (Hamilton 2003). Features such as hospital room windows and views, cleanliness, room spaciousness, and privacy have been linked to positive patient outcomes (e.g., Beauchemin and Hays 1996; Ulrich 1991). There is far less research on the effects of facility design on staff members (Ulrich et al. 2004). The literature that does exist suggests that health care environments affect staff members' health and safety and that improving workplaces can increase staff members' effectiveness and satisfaction and reduce errors (Ulrich et al. 2004).

Service Role

The demands of a service role can vary considerably. Many roles are knowledge and skill intensive, requiring college degrees and advanced on-the-job training (e.g., college professor, dentist). Conversely, many other service roles require modest skills (e.g., tollbooth operator, restaurant hostess). Service roles also vary in their emotional and/or physical intensity. Considerable literature is devoted to the emotional and/or physical intensity of jobs, including research that presents constructs such as work exhaustion (e.g., Moore 2000) and burnout (e.g., Cordes and Dougherty 1993) that describe the negative effects of jobs. Employees engaging in service encounters that are extended, affective, and intimate are likely to expend a significant amount of emotional labor (Price, Arnould, and Tierney 1995). *Emotional labor* refers to a self-regulatory process used by employees to display expected emotions (Hennig-Thurau et al. 2006; Hochschild 1983).

Overall, though the range of relevant literature is quite broad, our knowledge of the impact of the physical workplace on service providers' experience is limited. In particular, previous research has not delineated the processes through which the servicescape could affect service

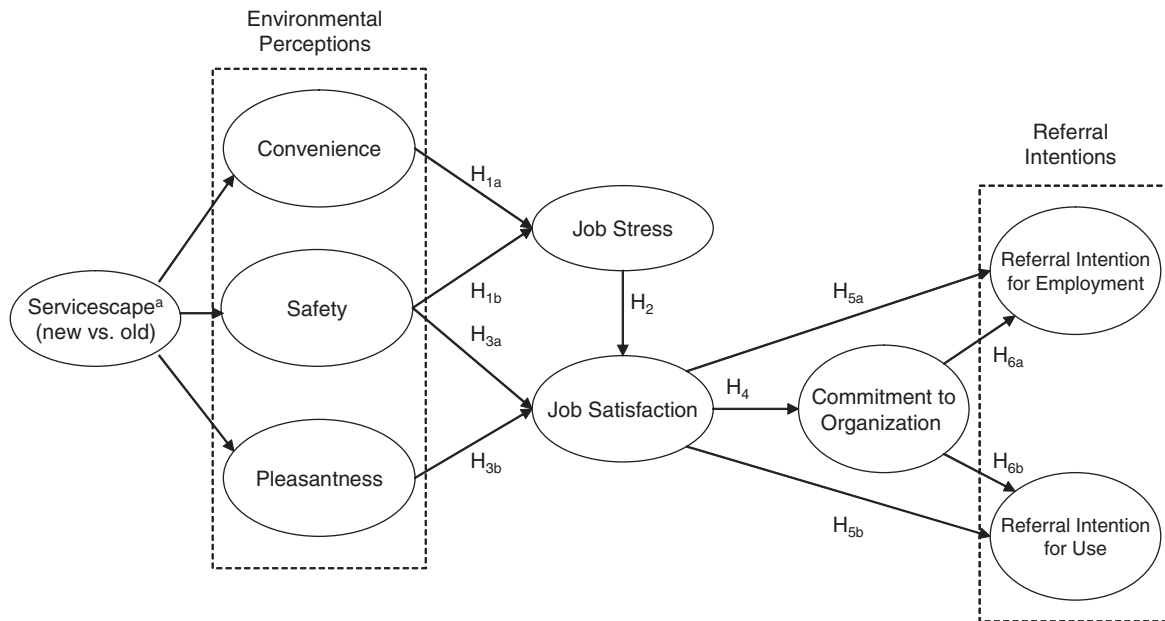
workers' job satisfaction or explained how job satisfaction could lead to referral intentions, which are important for service firms. We attempted in this study to address this gap by examining the various processes involved. Furthermore, previous research has tended to focus on individual design features of the servicescape (e.g., lighting, music) and has typically been cross-sectional. Our study involved a longitudinal examination of several dimensions of environmental perceptions that may serve as important design criteria for organizational decision makers.

Invested Service Work

In designing our study, our first task was to consider the variations in service provider experience, because facilities are likely to be more salient for some types of service providers than for others. We suggest that the time spent in the service place (immersion) and the demands of the service role (intensity) are key dimensions of service provider experience and that service work varies along these dimensions. Roles can be high in both intensity and immersion, high in one and low in the other, or low in both. Many service jobs combine high intensity and immersion. The work is demanding and, by and large, done in a specific place. We refer to people performing these service roles as "invested service workers" because they are highly invested in both the work (intensity) and the place (immersion). Air traffic controllers, mental health therapists, police dispatchers, and surgeons all fit the category of invested service workers. If the facility does not have a meaningful impact on work-related perceptions and intentions of invested service workers, it is unlikely to have a pervasive influence on those working under less demanding conditions.

We believed that the combination of immersion and intensity would typically elevate the importance and impact of a facility. Thus, if we did not find significant effects for invested workers, we would be less likely to find effects for others. Generally, this should be true. However, it is plausible that the specific nature of certain types of invested work could negate the influence of the facility. Stock exchange traders, for example, may be more or less oblivious to the aesthetics of the physical environment given the frantic pace of their work. We believed that our focal work group for this study, hospital nurses, would provide a good test of our premise. Hospital nurses are required to have extensive knowledge and skills, they perform physically and emotionally demanding work, and they typically work long shifts in specific work areas, often for 12 or more hours.

FIGURE 1
Impact of Environmental Perceptions on Invested Service Workers



NOTE: H = hypothesis.

a. The servicescape construct is set up for comparing the new with the old service environments. It is measured by a dummy variable coded 1 for the new wing and 0 for the original facility. Thus, the paths linking this construct to the environmental perception constructs represent the differences in the environmental perceptions between nurses who worked mainly in the new wing (the movers) and nurses who worked mainly in the original facility (the stayers).

A SERVICESCAPE MODEL FOR INVESTED SERVICE WORKERS: THE CASE OF HOSPITAL NURSES

Research in environmental psychology and in marketing related to the influence of the physical environment upon its users draws from the stimulus-organism-response (SOR) model in psychology (e.g., Donovan and Rossiter 1982). The SOR model suggests that the physical environment, or stimulus, leads to an evaluation by a person or organism, which results in a response (Mehrabian and Russell 1974; Passer and Smith 2007). In other words, the model assumes that the mental processes involving perceptions or evaluations influence behavior in positive or negative ways. Mehrabian and Russell (1974) suggested that the environment is either positively loaded or negatively loaded. Positively loaded environments (e.g., new) have the potential to produce positive responses (e.g., joy). Negatively loaded environments (e.g., dull) can lead to negative feelings (e.g., disappointment).

Researchers have shown that tangible cues in an organization's physical environment are significant in influencing customer attitudes and behavior (e.g., Baker, Berry, and Parasuraman 1988; Bitner 1990, 1992; Donovan and

Rossiter 1982). An organization's facilities also can influence employees' attitudes about their work and the work itself (Davis 1984). The SOR model is a useful framework for understanding the influence of the environment on employees, particularly on invested service workers who have demanding roles (intensity) and spend significant time in dedicated workplaces (immersion). Characteristics of the servicescape (e.g., pleasantness) serve as the stimulus, leading to an organism's evaluation (employee perceptions), which results in a response (e.g., job satisfaction). Therefore, we posit that specific perceptions about the servicescape influence invested service workers' job stress and satisfaction and, subsequently, their organizational commitment and referral intentions (Figure 1).

Dimensions of Environmental Perceptions

For parsimony, we do not cover every aspect of the servicescape in our model. Instead, we focus on three aspects that are prominent in the health care literature and should be relevant for many types of invested service workers outside of health care: convenience, safety, and pleasantness. Positive perceptions of each of these physical aspects should lead to positive outcomes. The convenience

of work spaces includes convenient access to needed supplies and equipment and a floor plan that facilitates the work. Conceptually, it is similar to the concept of functionality discussed in the servicescape literature (Bitner 1992). The combination of role intensity and place immersion should make the convenience of a work space a salient issue. Safety involves the degree of hazard present in a work space. Safety is a basic need, and immersion in a facility likely would raise sensitivity to potential safety issues, especially in work roles that are inherently dangerous. Pleasantness captures an overall evaluation of the ambience of a facility's design and is related to specific design features such as natural light, views of nature, and "off-stage" areas (Ulrich et al. 2004). When workers are in a service place for extended periods, especially when the work is intense, the pleasantness of the work space should be salient.

Influence of Environmental Perceptions on Job Stress

Job stress is a common by-product of invested service work, as several studies of the nursing profession have indicated (e.g., Boyle et al. 1991; Tyler and Cushway 1995). Job stress can lead to health problems (DeLongis, Folkman, and Lazarus 1988), accidents on the job, reduced job satisfaction (Judge, Boudreau, and Bretz 1994), and reduced ability and motivation to perform on the job (Motowidlo, Packard, and Manning 1986). Lazarus and Folkman (1984) and Lazarus (1966) adopted a cognitive perspective of stress, and they drew a distinction between stressors (characteristics of the environment that are thought to cause stress), the experience of stress, and strain (the physical or psychological consequences of stress). For this study, we defined job stress as the harmful physical and emotional responses of workers that occur when job requirements do not match capabilities, resources, or needs (National Institute of Occupational Safety and Health 1999). Consistent involvement in demanding situations is associated with physical and emotional exhaustion (e.g., Cordes and Dougherty 1993; Moore 2000). Job stress can arise from human interactions, for example, when workers interact with supervisors or customers. Stress also can result from experiencing the physical environment (Mehrabian and Russell 1974; Zimring 1981).

Although individual-level stress management approaches are still common in practice, the prevailing view in the literature is that more broadly focused organizational approaches should be the interventions of choice (Cousins et al., 2004). The overall design of the physical environment can increase or reduce stress (Connors 2001; Cooper, Dewe, and O'Driscoll 2001). The work intensity

experienced by invested service workers creates stress. In the case of hospital nurses, the work is physically demanding, long, dangerous, and interactive (with patients, families, doctors, and other nurses) and involves high stakes. An important issue is whether the physical space in which nurses are immersed adds to or helps relieve the stress brought by the work's intensity. Does the facility's design support capabilities, offer needed resources, and meet needs, or does it fail in these respects?

The effectiveness of facility design interventions is determined by individual perceptions (Selye 1956). Convenient layout and organization of supplies and equipment can save nurses considerable wasted effort, providing more time for patient care, reducing job stress, and increasing job satisfaction (Hendrich, Fay, and Sorrells 2002). Furthermore, job stress may also be affected by invested service workers' perceptions of workplace safety. As noted, invested service jobs can elevate safety concerns because of the long hours, the intensity of the work, and immersion in one place. Hospital nurses' safety concerns range from fear of back injuries (from lifting patients) to hospital-acquired infections (Berry et al. 2004; Sherer 1993). Previous research also provides evidence that employees who perceive that they work in safe buildings and for organizations that care about safety are likely to feel less stress (e.g., Harvey et al. 2002; Hofmann and Morgeson 1999; Williamson et al. 1997). Thus, we posited the following:

Hypothesis 1a: Perceived convenience is negatively related to job stress.

Hypothesis 1b: Perceived safety is negatively related to job stress.

Influences of Job Stress and Environmental Perceptions on Job Satisfaction

Consistent with Locke (1976), we define job satisfaction as a pleasurable or positive emotional state resulting from a person's appraisal of his or her job or job experiences. Job satisfaction is tied to meeting employee needs or goals (Mowday, Porter, and Steers 1982), such as pleasure attainment, security, and economic well-being. When service workers experience stress in carrying out their jobs, their job satisfaction should decrease because the stress felt runs counter to their pleasure-attainment goal. Previous research provides evidence that job satisfaction is negatively affected by emotional exhaustion or job stress (e.g., Barsky et al. 2004; Burke and Greenglass 1995). Therefore, we posited as follows:

Hypothesis 2: Job stress is negatively related to job satisfaction.

Because we postulated in Hypotheses 1a and 1b that the perceived convenience and safety of the environment directly and negatively affect job stress, these two perceptions would also affect job satisfaction indirectly through job stress when Hypothesis 2 is taken into account. Furthermore, job satisfaction could be directly affected by the perceived safety and pleasantness of the environment. Again, the SOR model would suggest that positive evaluations of the stimulus (environmental characteristics) lead to positive responses (job satisfaction). First, security is a universal personal value, that is, an enduring belief that people share regarding what is important in life (Schwartz 1992). A safe environment helps service workers attain this value in their workplace and hence could contribute to job satisfaction. The concern for security is likely to be accentuated for invested service workers. It is plausible that invested service workers could spend more time some days where they work than where they live. Second, a pleasant environment could provide service workers with hedonic benefits (pleasure or other hedonic enjoyment). Consequently, service workers will evaluate their jobs positively if they perceive the servicescape to be pleasant. Therefore, we expected a positive relationship between perceived pleasantness and job satisfaction. Third, both the organizational behavior and marketing literatures provide corroborative evidence about the effects of perceived safety and pleasantness on job satisfaction. Huang et al. (2004) found that job satisfaction is increased by evidence that employers care about the safety of their employees (e.g., investments in safe facility design). Furthermore, Baker, Berry, and Parasuraman (1988) found that employees perceive a pleasant work space as an indication of management's concern for their job satisfaction. Thus, we posited the following:

Hypothesis 3a: Perceived safety is positively related to job satisfaction.

Hypothesis 3b: Perceived pleasantness is positively related to job satisfaction.

We did not posit a direct association between convenience and job satisfaction or an association between pleasantness and job stress. Role conflict occurs when workers encounter demands that cannot be concurrently satisfied (Walker, Churchill, and Ford 1975). More specifically, role conflict refers to "the simultaneous occurrence of two (or more) sets of pressures such that compliance with one would make more difficult compliance with the other" (Kahn et al. 1964, p. 19). Nurses often have to make tough choices about what to do next. Role conflict leads to job stress (Cooper, Dewe, and O'Driscoll 2001; Jex 1998). The perceived convenience

of the facility can lessen conflict by enabling nurses to better handle multiple tasks, thereby reducing stress. Because convenience concerns primarily the ease of accomplishing tasks (and hence the lessening of stress) rather than other benefits that the servicescape may bring to service workers, we did not hypothesize a direct effect of perceived convenience on satisfaction beyond its indirect effect through job stress (Figure 1). Furthermore, because the pleasantness of the environment has little effect on the occurrence or avoidance of role conflicts, it was not expected to affect nurses' evaluation of the job stress they experienced. Instead, the benefit of a pleasant environment is represented by a direct effect on satisfaction.

Influence of Job Satisfaction on Organizational Commitment and Referral Intentions

Commitment is the belief that a relationship is sufficiently important to warrant strong efforts to maintain it (Morgan and Hunt 1994). Organizational commitment has been defined as "the relative strength of an individual's identification with and involvement in a particular organization" (Steers 1977, p. 46). Job satisfaction has been shown to be positively related to organizational commitment (Mowday, Porter, and Steers 1982). Job satisfaction is viewed as a reflection of immediate reactions to the workplace, whereas organizational commitment is believed to develop more slowly as employees learn more about their job and organization (e.g., Gaertner 1999; Vandenberg and Lance 1992). We posited the following:

Hypothesis 4: Job satisfaction is positively related to commitment to the organization.

Service workers' recommendations to their friends and family regarding employment or use of the service constitute positive word of mouth. Harrison-Walker (2001) defined word of mouth as "informal, person-to-person communication between a perceived noncommercial communicator and a receiver regarding a brand, a product, an organization, or a service" (p. 63). Just as organizations expect highly satisfied customers to deliver positive word of mouth (Brown et al. 2005), we expected that the same would be true for satisfied employees (Shinnar, Young, and Meana 2004). Furthermore, word of mouth has been shown to be an important outcome linked to commitment (Harrison-Walker 2001). Therefore, both job satisfaction and commitment to the organization were hypothesized to be positively related to referral intentions as follows:

Hypothesis 5a: Job satisfaction is positively related to referral intention for employment.

Hypothesis 5b: Job satisfaction is positively related to referral intention for use.

Hypothesis 6a: Commitment to the organization is positively related to referral intention for employment.

Hypothesis 6b: Commitment to the organization is positively related to referral intention for use.

RESEARCH METHOD

Data Collection

We collected data from a 210-bed hospital that offers emergency, inpatient, outpatient, and critical care services. We chose the hospital for participation because it was planning to build a new four-story wing that would provide an opportunity to study the influence of the servicescape on nurses. During data collection, perioperative surgical services, postanesthesia care, intensive care, and the cardiac catheterization laboratory moved to the new wing. The new wing's design features that differ from the original facility include all single-occupancy patient rooms that are 20% to 50% larger, more natural light and artwork, more hand-washing stations, and staff break rooms. We were able to evaluate the effects of the new wing by comparing responses before and after the move and the responses of nurses who worked in the new wing at least 50% of their time ("movers") with those who worked primarily in the original facility ("stayers"). Our study was a quasi-experiment conducted in a natural setting (Cook and Campbell 1979).

Using an identical questionnaire, we collected three rounds of data (2 months before the new wing was completed and 2 and 6 months afterward). Before each round of data collection, hospital administration announced the study and requested participation. We were careful not to alert the respondents that we were interested in the impact of the facility changes on them; the study was positioned as one on employee work attitudes. Additionally, respondents were not identified so that they would feel confident in honestly answering potentially sensitive questions (e.g., regarding supervisor support). Although having matched data over multiple rounds is generally preferable from a methodological standpoint, we felt that in this study, anonymity would result in more accurate data. In each round, we collected data for 2 weeks in different hospital meeting rooms at various times, including nights and weekends, to provide a convenient opportunity for all nursing staff members to participate. We provided Round 1 and 2 participants with a snack and a pen as a "thank you," and we entered Round 3 respondents into a drawing for one of ten \$50 gift cards issued by local merchants.

Approximately 480 nurses were eligible to participate in each round. Of these nurses, 235 (49%), 207 (43%),

and 264 (55%) completed our questionnaires in Rounds 1, 2, and 3, respectively. As Table 1 shows, the respondents were demographically similar across the three rounds. Approximately 90% of the respondents were full-time staff members (90%, 91%, and 94% in Rounds 1, 2, and 3, respectively); other respondents consisted of part-time staff members and contract workers. Even though part-time staff members and contract workers may work fewer hours during a pay period than full-time staff members, all of the nurses worked a minimum of an 8-hour shift, and some worked 16-hour shifts; the variance was based on the number of shifts worked per week. The long working hours per shift and the nature of the work suggested that all three types of nurses—full-time, part-time, and contract based—were invested service workers. Therefore, we included all three types in our sample.

Measure Development

To test the proposed model, we developed a questionnaire using existing scales and scales constructed specifically for this study. We created a categorical variable, servicescape, composed of two conditions (new wing and original facility) to represent the built environment to which the nurses were primarily exposed. We measured all other model constructs with 7-point, Likert-type scales. We crafted the items measuring environmental perceptions (convenience, safety, and pleasantness) on the basis of discussions with hospital administrators and health care design specialists. We adapted other measures, except the teamwork measure, from existing scales (the scale items are shown in the first column of Table 2; the remainder of Table 2 is discussed subsequently). We measured referral intentions for employment and use with a single item adapted from Patterson, Johnson, and Spreng (1997), specifically, "If a friend or family were in need of employment (the services of a hospital), I would certainly recommend _____."

In addition to the constructs under investigation, we included two control variables in our model estimation: supervisor support and teamwork. Supervisor support is the extent to which supervisors provide encouragement to their employees (Griffin, Patterson, and West 2001). Teamwork involves groups of employees working together to accomplish job-related goals (Parker and Wall 1998). Previous studies have suggested that these variables affect job stress and job satisfaction (e.g., Griffin, Patterson, and West 2001; Yukl 1989). Therefore, to mitigate possible biases in the estimation of the focal relationships under investigation, we controlled for the effects of supervisor support and teamwork by including the effects in our estimation.

TABLE 1
Summary Statistics of the Respondents' Personal Characteristics

Variable	Round 2			Round 3	
	Round 1	Stayers	Movers	Stayers	Movers
Number of usable observations ^a	235	158	48	172	64
Age (years)	39.5 ^b (10.3)	37.7 (11.2)	38.2 (9.3)	38.1 (11.4)	40.8 (8.8)
Gender					
Female (%)	90.0	90.4	83.3	87.7	87.3
Male (%)	10.0	9.6	16.7	12.3	12.7
Ethnicity					
Hispanic (%)	4.9	7.1	6.3	8.8	7.8
African American (%)	9.4	9.7	2.1	8.2	6.3
White (%)	79.0	78.1	85.4	77.2	77.8
Other (%)	6.7	5.2	6.3	4.7	7.9
Employment duration at the hospital					
< 3 months (%)	1.7	1.9	2.1	1.7	3.2
3 to 5 months (%)	2.6	5.1	12.5	7.6	3.2
6 to 11 months (%)	9.6	10.8	4.2	15.7	9.7
1 to 4 years (%)	39.3	36.1	29.2	30.8	33.9
≥ 5 years (%)	46.7	46.2	52.1	44.2	50.0
Employment status					
Full-time (32 to 40 hours/week) (%)	89.5	89.2	97.9	92.4	96.8
Part-time (16 to 31 hours/week) (%)	7.0	8.2	2.1	5.3	1.6
Contract staff member (%)	3.5	2.5	0	2.3	1.6

a. The usable observations exclude cases in which respondents did not report the percentage of time they worked in the new wing in Rounds 2 and 3.
b. For age, the first number is the mean, and the second number (in parentheses) is the standard deviation. For the other variables, the number in each cell represents the percentage of counts for the category concerned.

Before administering the survey, we conducted two focus groups with staff members from another health care facility to assess the clarity of the survey instructions and the appropriateness of item wording. We clarified the instructions and refined the wording of some items as a result of this process. We also asked several bilingual speakers to review the questionnaire to ensure that those who spoke English as a second language would understand the wording.

Analysis

We analyzed the data in three stages. First, we purified our multi-item measures and examined their psychometric properties by performing three-group confirmatory factor analysis (CFA) using Mplus 4.1 (Muthén and Muthén 2004) on the Round 1, 2, and 3 samples. The three-group analysis enabled us to examine the stability of the factor loadings over time (i.e., across the three rounds of surveys).

Second, our study was a quasi-experiment that includes a treatment (new wing vs. original facility), outcome measures, and experimental units (individual nurses) but did not use random assignment to create the comparisons from which treatment-caused change could be inferred (Cook and Campbell 1979). Instead, the comparisons depended

on nonequivalent groups (movers and stayers in different time periods) that might differ from each other in certain ways other than the presence of a treatment whose effects are being tested. These between-group differences that are not of focal interest could threaten valid causal inference. To ascertain the effects of the treatment, we needed to explicate the specific threats and address them. Thus, we used Dunnett's multiple comparison test to examine whether there was any persistent change in the nurses' perceptions after the new wing was opened for use (Kirk 1995). We compared movers with stayers in the Round 2 and 3 samples with the Round 1 respondents (the control group) on their environmental perceptions (convenience, safety, and pleasantness). The Round 1 respondents were chosen as the control group because the new wing of the hospital had not been completed when these data were collected. We expected no significant differences between the stayers (in Round 2 or 3) and the control group (because both worked in the original facility) and significant differences between the movers (in Round 2 or 3) and the control group if the differences between the groups arose primarily from the treatment and are stable over time.

Third, we tested our conceptual model (Figure 1) by performing two-group structural equation modeling (SEM) using Mplus 4.1 on the Round 2 and 3 samples

TABLE 2
Reliability Assessment

	Round 1			Round 2			Round 3		
	λ	ρ_c	ρ_v	λ	ρ_c	ρ_v	λ	ρ_c	ρ_v
Convenience		.74	.46		.80	.57		.79	.55
Supplies for our department are conveniently located.	.74			.80			.79		
I do not have trouble finding equipment when I need it.	.67			.72			.69		
The floor plan of the hospital makes it easy for staff to find what they need.	.68			.73			.75		
Safety		.90	.75		.92	.90		.93	.81
The facilities of this hospital encourage an emphasis on patient safety.	.79			.84			.86		
The facilities of this hospital encourage an emphasis on staff safety.	.94			.93			.93		
I feel that the facilities at _____ are safe.	.87			.92			.91		
Pleasantness		.79	.66		.81	.68		.80	.67
Our work area has features which are pleasant to look at.	.74			.74			.73		
The hospital has a pleasing look.	.88			.88			.91		
Job stress (Jamal and Baba 1992)		.80	.58		.84	.64		.83	.62
I have often felt nervous as a result of my job.	.71			.79			.78		
My job bothers me more than it should.	.90			.92			.89		
Sometimes when I think about my job I get a tight feeling in my chest.	.65			.68			.67		
Job satisfaction (Adams, Bond, and Arber 1995)		.84	.64		.83	.62		.85	.66
This job lives up to my expectations.	.86			.86			.87		
Knowing what I know now, I would apply for this job again.	.85			.83			.86		
This job does not undermine my health.	.68			.66			.69		
Commitment to the organization (Morgan and Hunt 1994)		.85	.83		.86	.85		.95	.80
The relationship that I have with _____ Hospital is something I am committed to.	.92			.93			.87		
The relationship that I have with _____ Hospital is important to me.	.98			.97			.96		
The relationship that I have with _____ Hospital is something I intend to maintain indefinitely.	.85			.88			.80		
The relationship that I have with _____ Hospital is something I care about.	.91			.91			.93		
The relationship that I have with _____ Hospital is worth my effort to maintain.	.90			.91			.89		
Supervisory support (Babin and Boles 1996)		.92	.73		.91	.72		.93	.76
My supervisor does not talk down to employees.	.88			.85			.92		
My supervisor gives full credit to ideas contributed by employees.	.90			.90			.92		
My supervisor never criticizes employees over minor things.	.88			.88			.90		
My supervisor really stands up for his/her staff.	.76			.75			.74		
Teamwork		.93	.86		.89	.80		.93	.87
There is a lot of teamwork among the patient care staff in my unit.	.90			.91			.93		
The staff in general cooperates with each other in my unit.	.96			.88			.93		

NOTE: For each construct, we provide the standardized item loadings (λ), composite reliability (ρ_c), and average variance extracted (ρ_v).

only, because these two samples contained both the movers and the stayers. The two-group analysis enabled us to examine whether our model was replicated across

the Round 2 and 3 samples, that is, whether our model could be generalized across different times. Several constructs in our model—servicescape, referral intention for

employment, and referral intention for use—were measured by single indicants. The servicescape construct was measured by a dummy variable (1 = new wing, 0 = original facility). Because the correspondence between this construct and its measure was exact, we set the error variance of its measure to zero in the structural equation model. The intention constructs were concrete dimensions of judgment (Rossiter 2002) and had virtually unanimous agreement by raters as to what they were. As such, there was no question of unreliability (Rossiter 2002), and we took the error variance of the intention measures as zero. In addition, the unexplained variations in the three environmental perception constructs (convenience, safety, and pleasantness) may be related to some unobserved common antecedents (e.g., a person's susceptibility to environmental influences). Therefore, to control for the influences of these unobserved drivers, we allowed correlations between the disturbance terms of the environmental perception constructs. Similarly, the disturbance terms of the referrals for the employment and use constructs would be correlated, because both constructs may relate to some unobserved common drivers (e.g., individuals' tendency to offer opinions). Thus, we also allowed correlation between these disturbance terms.

Multiple-group SEM analysis presumes that the samples under study are independently drawn from the target population. Because our samples were not independent (nurses could participate in Rounds 2 and 3), the chance of not rejecting the null hypothesis when it was not true (a Type II error) was inflated. However, this also meant that we could be more confident of our findings if our model estimation supported our hypotheses (i.e., rejecting the null hypotheses) despite the lower power of the hypothesis tests.

RESULTS

Confirmatory Factor Analysis

An initial CFA indicated that the majority of the standardized item loadings were high (above .6). There were several items with lower loadings, and upon examination of the item wording, we determined that the items were either ambiguous or did not closely reflect the meaning of the constructs they were intended to measure. For example, the job stress item "I feel guilty when I take time off from the job" may also reflect personality traits. As a result, we removed the problematic items on both empirical and conceptual grounds. The initial CFA results also suggested that substantial gain in model fit could be achieved by allowing correlation between the error terms of two commitment items ("The relationship that I have

with _____ Hospital is something I care about" and "The relationship that I have with _____ Hospital is worth my effort to maintain"). Because the two items were close in meaning, we allowed the correlation.

We implemented the foregoing changes and performed another CFA that resulted in substantial improvement in model fit. We also examined the invariance of factor loadings across Rounds 1, 2, and 3 by constraining the item loadings to be equal and testing the change in the χ^2 goodness-of-fit index caused by the constraint. The test results showed no difference in the loadings across the three groups: $\chi^2(34) = 38.3, p > .10$. Therefore, we examined only the results of the constrained model. Global fit indexes suggest an acceptable fit for the model: $\chi^2(806) = 1,379, p < .001$, comparative fit index (CFI) = .96, Tucker-Lewis index (TLI) = .95; root mean square error of approximation (RMSEA) = .055, and standardized root mean square residual (SRMR) = .046. The χ^2 statistic's significance at the .001 level may be related to the large sample size used (706 cases). Model fit is considered acceptable when the CFI and TLI are equal to or above .90, the RMSEA is less than .08, and the SRMR is below .05 (Bagozzi and Yi 1988; Byrne 1998; Diamantopoulos and Siguaw 2000). Thus, our model fit was adequate.

In addition to the global measures of fit, we assessed the fit of the model's internal structure by examining the item loadings, the reliability, and the discriminant validity of the measures. All loadings were significant at the .001 level. Furthermore, as Table 2 shows, all standardized loadings are greater than the .6 criterion suggested by Bagozzi and Yi (1988).

Overall, the loadings corroborated the model fit. In addition, we estimated from the loadings two reliability measures for each construct: composite reliability (ρ_c) and average variance extracted (ρ_v). As Table 2 shows, the composite reliability measures were above .6. Also, with the exception of the Round 1 estimate for the convenience construct (.46), the average variance extracted was above .5 for all the constructs and all rounds. Therefore, the measures satisfied suggested reliability criteria (Bagozzi and Yi 1988; Diamantopoulos and Siguaw 2000).

To complete our assessment of the structural fit, we examined whether the measurement model satisfied two conditions that demonstrate discriminant validity. First, following the recommendation of Anderson and Gerbing (1988), we assessed the discriminant validity by constraining the correlation between two constructs to be equal to one and then performing a χ^2 difference test on the χ^2 values obtained for the constrained and unconstrained models. We conducted this test for one pair of factors at a time and found that all χ^2 statistics were significant at the .001 level, in support of discriminant validity. Second, we found that for every pair of constructs,

TABLE 3
Environmental Perceptions: Dunnett's Multiple Comparison Test Results

<i>Variables</i>	<i>Round 1 Respondents (control)</i>	<i>Round 2 Stayers</i>	<i>Round 2 Movers</i>	<i>Round 3 Stayers</i>	<i>Round 3 Movers</i>
Convenience	3.74 (0.10)	3.85 (0.11)	4.48 ^a (0.21)	3.90 (0.11)	4.73 ^b (0.18)
Safety	4.95 (0.09)	5.18 (0.11)	5.58 ^a (0.19)	4.96 (0.10)	5.73 ^b (0.16)
Pleasantness	2.62 (0.07)	2.76 (0.08)	3.60 ^b (0.14)	2.66 (0.08)	3.64 ^b (0.12)

NOTE: Standard errors of the mean estimates are given in parentheses.

a. The mean estimate concerned is greater than the control group mean estimate ($p < .01$).

b. The mean estimate concerned is greater than the control group mean estimate ($p < .001$).

the confidence interval (± 2 standard errors) around the correlation estimate between two constructs did not include 1, which provided further support for discriminant validity (Anderson and Gerbing 1988).

Multiple Comparison Tests

When the service environment changes (e.g., when nurses move from the original facility to the new wing), perceptions about the environment may also change. The paths from the servicescape construct to the perceptions constructs capture these possible changes in perception. We treated these possible differences as an empirical issue in this research. After confirming the validity of our measures, we calculated a respondent's score on each environmental perception construct by taking the average of the retained items for each construct. Then, using the respondents' scores, we conducted Dunnett's multiple comparison tests. The test results supported our expectation (Table 3). Specifically, the results provided evidence that the Round 2 and 3 movers were higher in the three environmental perception variables than Round 1 respondents. In contrast, the results showed no significant differences between the stayers (Rounds 2 and 3) and the Round 1 respondents. Overall, the results provided preliminary evidence that nurses who worked primarily in the new wing (movers) evaluated the environment more favorably than did nurses who had no exposure to the new wing (Round 1 respondents). The difference in the results between movers and stayers also rules out the possibility that the better environmental perceptions of the movers can be explained by unobserved time-dependent factors. If these factors did have an influence on the respondents, they would have affected movers and stayers similarly. Furthermore, the more favorable perceptions that the movers showed in Round 2 (2 months after the move) were also exhibited in Round 3 (6 months after the move). Therefore, it is not likely that the more favorable perceptions reported by the movers in Round 2 were caused by their perceived novelty of the new wing. We

are confident that our findings are a result of the changes in the environment and not simply due to its newness.

SEM Analysis

Model modifications and fit assessment. Using the purified measures, we performed a two-group SEM analysis on the model we postulated (Figure 1). As Table 4 shows, the signs and the magnitude of the construct correlations in our revised model were consistent with our expectations. For example, the environmental perception constructs were correlated negatively with job stress and positively with job satisfaction. The model estimation output suggested two changes to the model specification for the control variables, supervisor support and teamwork. First, we found that the effect of supervisor support on job stress was nonsignificant at the .05 level for Rounds 2 and 3, and we removed it. Second, the modification indexes suggest that the model fit could be improved by including the effect of supervisor support on referrals for employment. This effect seems plausible because employees are likely to provide their friends or relatives who are considering applying for jobs in their organization with information about supervisory support, a concern for many job applicants. We accepted this change as well. As in the CFA, we then examined the invariance of the item loadings across the two groups (Rounds 2 and 3) by conducting a χ^2 difference test. The test results did not suggest a difference in the loadings across them: $\chi^2(17) = 11.0$, $p > .10$. Furthermore, the unstandardized path coefficient estimates were similar and their signs consistent across the two groups. The invariance of all these estimates across the groups was also supported by the result of a χ^2 difference contrast test: $\chi^2(17) = 23.6$, $p > .10$. Therefore, both the measurement and the structural parts of the model can be generalized over time, and consequently, we report only the results of the model with both the loadings and the path coefficient estimates set to be equal across the two groups (Table 5).

The global fit indexes provided mixed evidence about model fit: $\chi^2(707) = 1,292$, $p < .001$, CFI = .94, TLI = .94,

TABLE 4
Construct Correlations for Rounds 2 and 3

	1	2	3	4	5	6	7	8	9	10	11
1. Servicescape		.25	.20	.40	-.09	.18	.12	.12	.11	.02	.13
2. Convenience of work spaces	.22		.61	.68	-.23	.32	.22	.21	.21	.00	.03
3. Safety of work spaces	.20	.63		.60	-.25	.41	.28	.27	.26	.00	.03
4. Pleasantness	.38	.65	.63		-.19	.38	.26	.25	.24	.01	.05
5. Job stress	-.04	-.23	-.24	-.18		-.36	-.24	-.25	-.23	-.08	-.21
6. Job satisfaction	.10	.33	.43	.38	-.40		.68	.73	.63	.47	.43
7. Commitment to the organization	.07	.21	.27	.25	-.26	.64		.62	.57	.32	.29
8. Referral intention for employment	.06	.20	.26	.23	-.26	.71	.60		.79	.47	.35
9. Referral intention for use	.06	.19	.25	.23	-.24	.59	.53	.73		.30	.27
10. Supervisor support	-.02	-.01	-.01	-.01	-.11	.56	.36	.52	.33		.40
11. Teamwork	-.08	-.02	-.02	-.03	-.21	.51	.33	.40	.30	.50	

NOTE: Round 2 construct correlations appear below the diagonal, and Round 3 construct correlations appear above the diagonal. The covariance matrices of the measurement items (manifest variables) are large in size (29 rows by 29 columns for each matrix), and thus we do not show them here for simplicity and space constraints. The matrices are available from the first author on request.

TABLE 5
Unstandardized Path Coefficient and R² Estimates

Relationships	Coefficient Estimate	R ² Estimates
Convenience		.047, .061 ^a
Servicescape → convenience	.79***	
Safety		.041, .041
Servicescape → safety	.53***	
Pleasantness		.14, .16
Servicescape → pleasantness	1.3***	
Job stress		.11, .11
Convenience → job stress	-.12*	
Safety → job stress	-.21**	
Teamwork → job stress	-.23***	
Job satisfaction		.64, .51
Safety → job satisfaction	.24***	
Pleasantness → job satisfaction	.14***	
Job stress → job satisfaction	-.15***	
Supervisor support → job satisfaction	.26***	
Teamwork → job satisfaction	.22***	
Commitment		.41, .46
Job satisfaction → commitment	.70***	
Referral intention for employment		.56, .59
Job satisfaction → referral intention for employment	.57***	
Commitment → referral intention for employment	.28***	
Supervisor support → referral intention for employment	.14***	
Referral intention for use		.38, .43
Job satisfaction → referral intention for use	.52***	
Commitment → referral intention for use	.29***	

a. The first number is the R² estimate for the Round 2 sample and the second the R² estimate for the Round 3 sample. The estimates are not identical because we allowed the variance of the disturbance term of each endogenous construct to vary across the two samples.
p* < .05; *p* < .01; ****p* < .001 (one-tailed test).

RMSEA = .059, and SRMR = .11. The CFI and TLI were above .90, and the RMSEA was below .08, thus indicating acceptable fit. However, the SRMR was above .05, suggesting inadequate fit. The global fit indexes do not assess all aspects of a model's appropriateness for the data (Bagozzi and Yi 1988; Mulaik et al. 2000). It is also necessary to assess the model's internal structure before drawing conclusions about a model's acceptability.

Consequently, we examined the item loadings and the unstandardized path coefficient estimates for assessing the structural fit. The item loadings in the SEM results were close to the loadings in the CFA results. Therefore, the former loadings passed the reliability and discriminant validity criteria. Furthermore, as Table 5 shows, all path coefficient estimates were significant at the .05 level or lower, and their signs were consistent with our expectation. Therefore, assessing both global and structural fit, we consider our model acceptable.

Hypothesis testing and model performance. After confirming model fit, we examined the unstandardized path coefficient estimates in greater detail. As Table 5 shows, the observed effects of servicescape (new wing vs. original facility) on the three environmental perception variables (convenience, safety, and pleasantness) were positive and significant at the .05 or lower level. These effects represent the differences between the environmental perceptions of movers and stayers. Therefore, the results suggest that the new wing was perceived to be better than the original facility in terms of the three environmental variables. The rest of the path coefficient estimates in the model relate to our hypotheses. Because all hypotheses were directional, we applied one-tailed *t* tests for significance assessment. All of our hypotheses were supported. Specifically, the results in Table 5 provided support for (a) the negative effects of perceived convenience

and safety on job stress (Hypotheses 1a and 1b), (b) the negative effect of job stress on job satisfaction (Hypothesis 2), (c) the positive effects of perceived safety and pleasantness on job satisfaction (Hypotheses 3a and 3b), (d) the positive effect of job satisfaction on commitment to the organization (Hypothesis 4), (e) the positive effects of job satisfaction on referral intentions for employment and use (Hypotheses 5a and 5b), and (f) the positive effects of commitment to the organization on referral intentions for employment and use (Hypotheses 6a and 6b). Apart from testing the relationships in our model, we also assessed the ability of the revised model to explain variation in the dependent variables. We found that the proportion of variance explained (R^2) was high (above .4) when the dependent variable involved was job satisfaction, commitment, or referrals for employment (Table 5).

Our model suggested that the effect of our categorical servicescape variable (original facility vs. new wing) on job satisfaction was mediated by environmental perceptions (convenience, safety, and pleasantness) and job stress. To test this mediation role, we checked the four conditions suggested by Baron and Kenny (1986) for establishing mediation in two steps. First, we modified our model by removing the mediators (environmental perceptions and job stress) and adding a path from servicescape to job satisfaction. We then performed two-group SEM on the modified model. The SEM results showed that the coefficient estimate of the added path was substantial (.37) and significant ($p < .001$). Thus, the first mediation condition was met. In the second step, we also included the path from servicescape to job satisfaction but kept the mediators (environmental perceptions and job stress) and the relationships associated with them. Conducting two-group SEM on this expanded model, we found that the coefficient estimates of the relationships between servicescape and the mediators, and between the mediators and job satisfaction, were significant at the .05 level and in the expected direction. Therefore, the second and third mediation conditions were fulfilled. We also found that the coefficient estimate of the added path from servicescape to job satisfaction was small (.06) and nonsignificant at the .05 level. This estimate was much smaller than the coefficient estimate for the same path found in the first step, when we excluded the mediators. In other words, the inclusion of the mediators reduced the observed direct effect of servicescape on job satisfaction to a nonsignificant level, thus meeting the fourth mediation condition. In sum, our mediation test suggests that the effect of servicescape on job satisfaction was totally mediated by environmental perceptions and job stress.

To test our assumptions that pleasantness is not associated with job stress and that convenience is not directly

associated with job satisfaction, we incorporated these paths and estimated this expanded model. The results showed that the added paths were not significant at the .05 level; hence, our model's assumption cannot be rejected. In addition, we examined the relative importance of various factors affecting a particular construct by referring to the standardized path coefficient estimates of our model. As Figure 2 shows, perceived safety seemed to be a more important variable explaining both job stress and satisfaction than were perceived convenience and pleasantness. The control variables, supervisor support and teamwork, were comparable with the environmental perceptions in their effects on job stress and job satisfaction.

Results Summary

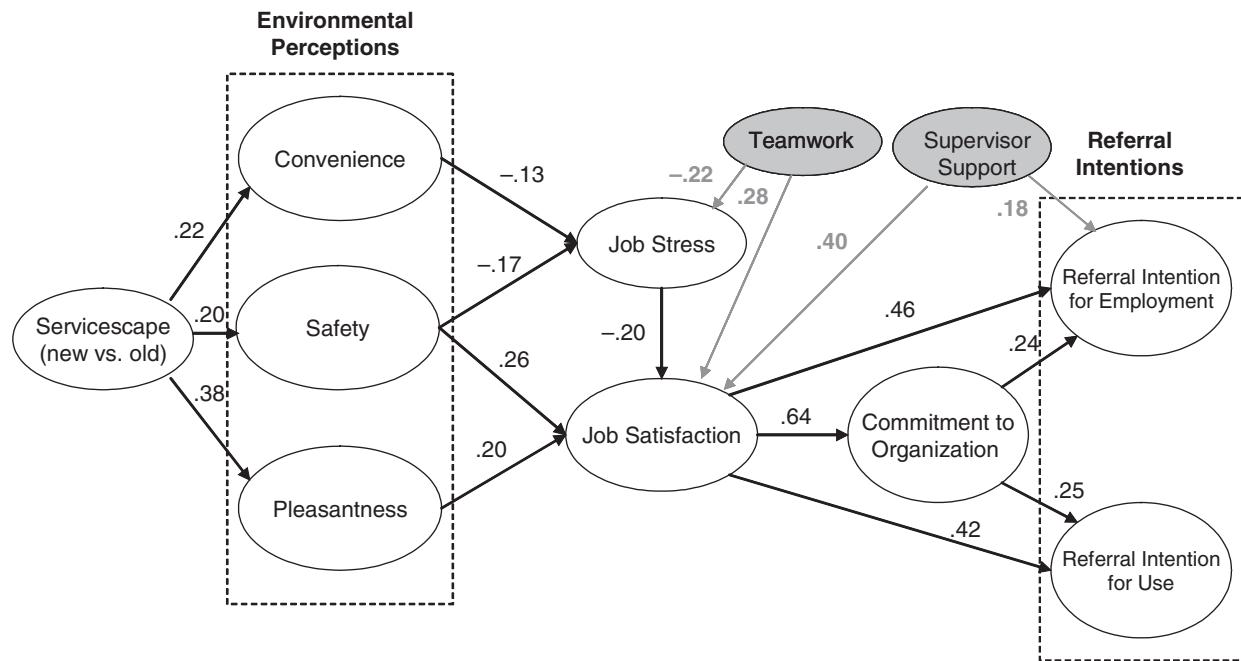
On the basis of the CFA results, we purified our measures and confirmed that they possessed the desirable psychometric properties. Our multiple comparison test results ruled out the possibility that the observed differences in the perceptions between the movers and stayers were caused by unobserved time-dependent factors. Last, the SEM estimation results supported all relationships hypothesized in our model. The relationships can also be generalized across the Round 2 and 3 samples (i.e., over time), thus enhancing the external validity of our findings.

DISCUSSION

The role of buildings warrants attention in the service literature. Given that most service performance occurs within some kind of physical structure, a greater understanding of this topic is merited. Can service researchers play a more active role in helping ensure that health care and other kinds of service facilities are designed to effectively serve the people who use them? We believe that they can and hope that the research reported herein will stimulate more interest in this field of study.

Our study shows that the physical workplace matters to the invested service workers we studied, hospital nurses. Empirically supporting the servicescape's impact on invested worker attitudes contributes to multiple literatures. Marketing literature on the servicescape focuses on the customer impact. The best known marketing article that does include the employee perspective is Bitner's (1992) article, which is conceptual. Bitner made a strong conceptual argument that our empirical results support. The health care literature on the impact of the built environment also emphasizes the customer impact (i.e., effects on patients; Ulrich et al. 2004). Organizational behavior literature on job satisfaction tends to focus on variables other than the physical workplace, for example,

FIGURE 2
Standardized Path Coefficient Estimates



NOTE: All coefficient estimates were significant at the .05 level or lower. The estimates differed across the two samples because we allowed the variance of the constructs to vary across the samples. The control variables, supervisory support and teamwork, and their effects are in gray.

teamwork, pay, and supervisor support. Studies that have been done on the physical environment's influence on employee satisfaction have focused on office and factory settings rather than on environments where service providers and customers interact.

Our study shows the effects of environmental perceptions upon nurses' attitudes. Specifically, the convenience, safety, and pleasantness of the servicescape significantly affected the job stress and satisfaction of our sample of nurses. All hypotheses concerning the relationships among our model's variables (environmental perceptions, job stress, job satisfaction, commitment to the organization, and referral intentions for employment and use) were supported. In addition, our servicescape variable, which distinguished the movers (those working in the new wing during Rounds 2 and 3) from the stayers (those remaining in the original facility), showed significant differences in the three environmental perception variables: convenience, safety, and pleasantness. In each case, the movers had more positive perceptions than the stayers.

The management literature emphasizes that job satisfaction and employee commitment can be strengthened through various human resource practices. Our results show that teamwork influences both job stress and job

satisfaction and that supervisor support has a sizable influence on job satisfaction. The way that staff members work together and their perceptions of their supervisors have important implications for job stress and job satisfaction. However, our results also indicate that the design of the facility in which employees work influences job satisfaction and employee commitment. This is an important finding. In a number of cases, the effects of the environmental variables we studied were close to the effects of teamwork. Our results demonstrate nearly identical effects for safety on job satisfaction as for teamwork. The influence of supervisor support is greater, but clearly the role of facility design should be included in considerations of antecedents of job stress and satisfaction for certain kinds of service workers.

The relationships among environmental perceptions, job satisfaction, and referral intentions warrant special emphasis in a hospital nursing context. The nursing shortage is a major concern for hospital administrators, and the influence of nurses' facility perceptions on their referral intention for employment is noteworthy. Moreover, health care is a high-stakes credence service for patients. Nurses' referrals of their hospital to prospective patients

can be expected to be especially valuable because of their "insider" view and source credibility (Gronroos 2004).

One of our most intriguing findings was the connection between the facility and perceived safety. Perceived safety was negatively related to job stress and positively related to job satisfaction. Caring for acutely ill patients is hazardous. In a 2001 American Nurses Association study, 88% of nurses indicated that health and safety concerns affected their decisions to leave nursing (Tienman 2001). The role that facility design can play in making the nursing job safer is a critical one. As one nursing association executive stated in a presentation: "If you want to solve the nursing shortage, build safer hospitals" (Gelinas 2006).

Our findings regarding safety prompted us to conduct separate, informal focus group interviews with stayers and movers after the completion of data collection. We hoped that the group discussions would help us interpret our findings; they did for safety and several other results. The cleanliness of the new wing influenced respondents' perceptions that it was safer than the original facility. This is consistent with nurses' perceived risk for acquiring an infection.

Managerial Implications

The service facility is typically the most tangible part of the inseparable service experience not only for customers but also for providers. And while customers come and go, many providers spend their work shifts in the same facility. The concept of "place" involves a broader set of issues in the marketing mix for inseparable services; it not only is where customers obtain the service but also where employees perform it. For service workers performing intense work while immersed in a specific place, the design of that place can be especially important.

The effective marketing of labor-intensive services requires human resources practices that attract and retain the caliber of people needed to implement the marketing strategy and that prepare, enable, and encourage them to do it well. Our research shows the salient role the facility plays in contributing to these requirements in the context that we studied. The design of service facilities cannot simply be delegated to architects, designers, and facility planners; this is a central marketing and human resources issue.

An organization's service facilities reflect its values and are instrumental in the execution of its strategy. Without words, a building communicates to the people who use it. The building may communicate modernity and progressiveness or the opposite; it may communicate management's concern for the well-being of the staff or a lack of concern; it may communicate that management is "in touch" with needs in the organization or that it is "out of touch."

The hospital we studied improved facility features with its new wing. The layout is more convenient. The features are more pleasant (e.g., more natural light, greater use of artwork). The facility feels safer. The nurses working in the new facility noticed these differences. Our results demonstrate empirically that the movers believe that they are better off in the new wing. Consistent with this finding, no one in our mover focus group expressed a desire to work again in the original facility. However, mover focus group participants clearly wished that they had been given more of an opportunity to provide input on the design of the new building. As one nurse stated, "Functionality took a backseat to beauty in the design of the new wing. It should have been designed with nurse habits in mind." Although the hospital administrators did consult with several nurses during the design phases, it is apparent that some of the nurses felt their work needs were not fully incorporated into the new facility. Managers need to benefit from facility users' experience and insight during design and implementation to avoid unintended consequences.

The stress inherent in performing invested service work suggests an important facilities design goal of fostering teamwork and social support within the work group. Design also needs to promote desired work processes. Heart surgeon Dr. Paul Uhlig (personal correspondence, 2006) tells a story that illustrates the necessity of decision makers' understanding the needs of users of a facility before designing it:

It is very interesting working in different units and watching how nurses in particular modify their interactions depending on how the unit is designed. An example is the way in which nurses cover for each other when there is a central area by keeping an eye on each other's patients. I think there is an unspoken assumption in the analysis/design process that care is mostly one nurse/one patient (or several patients) when actually care is more of a "social" experience with overlapping efforts of a group of nurses in response to constantly varying time/acuity needs of their population of patients. One place I saw that demonstrated profoundly was in the redesign of a post-operative open heart unit in Grand Rapids. The old unit was a four-bed ward. When the patients would come out of the operating room the nurses in the unit would "swarm" around the new patient in a beautifully (and unconsciously) orchestrated group effort to settle the patient, untangle the lines, connect the monitors, check the vital signs and monitor chest tube output. They were able to do this because they could still each keep the corner of their eye on the other patients, all of whom were in close physical proximity with no barrier.

The new unit they were moving to was a linear hallway with a long row of individual patient rooms with glass front sliding doors which physically isolated them from their primary patient if they left to help another nurse. They were very concerned about it, and were working on ways to overcome this unintended complicating factor affecting their very effective workflow.

Facilities design research can include observing staff members as they work in existing facilities and inquiring about design features that enable or inhibit them and about what is missing that they need. Formal facility assessment and preference surveys also can be helpful, as can taking selected staff members on site visits to evaluate other newer facilities. The predesign research phase also can include creating drawings, physical models, and actual-size “mockups” of spaces (e.g., a patient room) and soliciting user input.

Research should not end when a new building is occupied. Some design mistakes can be corrected. Our focus group interview with movers revealed design mistakes that could have been rectified early in the postoccupancy phase. For example, the exit ramp for patients in wheelchairs was too steep and considered unsafe. As one nurse stated, “When you discharge a patient, the ramp outside is scary. It gets wet and it is very hard to take someone in a wheelchair down it slowly. I have to get help from larger nurses to take patients down the ramp.” Marketers know that much can be learned from experienced product users to improve the product; this is no less true for building users.

It is common for organizations to build additional facilities or remodel existing ones. It is also common for organizations to have part of their staff in a new or remodeled facility while other staff members remain in the older environment. Managers should consider the impact of new facilities on staff members who will not work in them. Our poststudy focus group interview with stayers suggested that the hospital’s management should have been more attentive to making facility improvements for them, given that they were left behind in the original facility about which they had concerns.

Research Limitations and Implications

Our study had several limitations that should be considered in interpreting the results and planning future research. First, we focused only on service providers’ responses to the facility, not on customers’ responses. We had no basis for comparing patients’ responses to the new wing with the nurses’ responses we report herein. Research that measures and compares customer and service provider responses to a facility would be useful

because of the potential for service providers’ experience in the facility to affect the quality of their service. A study that includes multiple firms (or even one firm with a mix of different kinds of facilities) could investigate the association between service providers’ ratings of their facility and customers’ ratings of the service quality they receive at that facility. A combined service provider–customer study also could reveal the degree to which customers and service providers agree on the value of various features in the servicescape. Such research could guide firms in designing service facilities that appeal to both customers and employees.

Second, our nursing samples were not matched from one period to the next, for the reason discussed previously. Not identifying each respondent prevented us from tracking the individual reactions of nurses to the original facility before they moved and to the new wing after they moved. Under conditions that allow the identification of individual respondents, studies similar to ours could obtain more precise estimation of the relationships under study by tracking individuals’ reactions to changes in the servicescape.

Third, we cannot generalize our findings to other types of invested service workers. We believe that the service facility is a salient source of influence for most types of invested service workers because of the combination of immersion and intensity. However, we would expect the relative importance of specific facility features to vary. In addition, we cannot generalize our findings to other types of service providers who work in a specific facility and interact with customers but whose jobs are less intense or immersive than the hospital nurses we studied. For example, do the ambience, attractiveness, and other features of a physical retail store affect the job stress and satisfaction of salespeople working in the store? Can more be done in designing a call center to relieve burnout and enhance job satisfaction? We believe that the facility could be consequential for other types of service providers, but this will require extensive additional research to understand these effects.

Fourth, our study did not go as far as other research could in examining the influence of specific facility features. We found, for example, that pleasantness of the servicescape affected nurses’ job satisfaction. To assist architects and facility designers, future research should evaluate the relative influence of possible antecedents or components of pleasantness, such as natural light, artwork, and water features. Note that some kinds of design may have positive effects on some perceptions but negative effects on other perceptions. For example, a curved hallway may enhance pleasantness but reduce convenience or safety.

Fifth, we measured outcome perceptions and intentions. Further research could collect actual behavioral data to

supplement perceptual and intention data, such as employee turnover, absenteeism, and injuries. Additionally, job stress is a very complex variable, and future research might consider the potential of specific design features to invoke eustress (i.e., positive stress) as well as reducing negative stress. Future research could also seek to account for individual coping behaviors in dealing with job stress and investigate the possible curvilinear relationship between employees' job stress and performance.

From our study's limitations spring future research opportunities. The physical places in which services are performed deserve more attention in the service literature. When the product is an inseparable, interactive service, a facility's design is important not only because of its direct effect on customers' experience but also because of its possible indirect effect due to the building's impact on service providers.

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