Effects of Servicescape on Perceived Service Quality, Satisfaction and Behavioral Outcomes in Public Service Facilities

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Abstract
The identification of significant factors affecting the behaviors of customers and occupants of physical environments and assessing their importance are imperative for effective architectural planning and design. This study investigated the effects of servicescape on perceived service quality and behavioral intention. The four main factors of servicescape selected for this study were attractiveness, cleanliness, layout, and comfort; the two perception indicators were service quality and satisfaction; and the behavioral outcome measures were loyalty and public service facility revisit intentions. A total of 594 questionnaires were collected from the users of five public service facilities located in Seoul, Korea. SPSS 18 and Lisrel 8.54, confirmatory factor analysis, and structural equation modeling (SEM) were used to test hypotheses.

The results revealed that cleanliness had a significantly direct impact on users’ satisfaction and an indirect impact on loyalty and reuse in public service facilities. Easy layout (easy access) was also found to be an essential factor for service quality and satisfaction. The findings also support the positive effects of comfort on perceived service quality and satisfaction. Although attractiveness was expected to be an indicator, the results failed to support a relationship between attractiveness and service quality or satisfaction.

Keywords: Servicescape; service quality; satisfaction; revisit intention; public service facilities

1. Introduction
Most people spend one-fifth of their lives indoors, which significantly affects their actions, status, abilities, and performances (Sundstrom et al., 1994). As one of the fundamental human requirements, indoor environments should provide appropriate physical conditions that allow people to do whatever they need to do comfortably (Roelofsen, 2002). In today’s rapidly changing environment, how service quality can be measured and how service facilities are planned, designed, and managed to ensure improved service quality are important. Much scholarly work has been done on the topic of the relationship between the characteristics of surrounding environments and the productivity or satisfaction of employees (Sundstrom et al., 1994; Ha et al., 2002); however, the physical environment has an impact not only on the satisfaction of employees but also on customers’ purchase intentions, revisit intentions, and comprehensive satisfaction in the case of service industries. The impact of surrounding environments on customer behavior has been researched by architects, landscape architects, and environmental psychologists (Turley & Milliman, 2000).

The increasing demands for cultural, athletic, and artistic facilities have forced local governments to provide local residents with a variety of public service facilities in South Korea. Most districts of Seoul, the capital of South Korea, have assembly halls, youth centers, and culture and sports centers to comply with the requirements of local residents. However, 42.9% of users are still not satisfied with public service facilities in terms of the appropriateness of the facilities (Korean Ministry of Culture, Sports and Tourism, 2003). Public service facilities are being constructed with user taxes, but it is difficult to tell what efforts have been made to improve their performance (Yi & Komatsu, 2010). It is highly probable that the managers of these facilities are not quite sure about what users need from the facilities’ services.

Facility management (FM) has to effectively perform functions that encompass a wide range of activities in order to effectively manage built assets and deliver services to customers (Amaratunga, 2000). In order for public service facilities to be considered useful, their services, programs, and surrounding physical

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environments should be well suited to the end users. Facility service should be focused on customers, and facilities should be able to offer high-quality service to support facility users (Rondeau et al., 2006).

The term "servicescape," sometimes called "atmospheres" and coined by Bitner (1992), refers to several dimensions of the physical or built environment that impact the behaviors of customers and employees in service organizations; these dimensions comprise both the tangible and the intangible features that make up the service experience (Hoffman & Turley, 2002).

The purpose of this study is to identify the main factors and relevant characteristics of servicescape that promote the effective design and management of public service facilities and to investigate the relationships between servicescape factors (attractiveness, cleanliness, layout, and comfort) and perception indicators (service quality and satisfaction) and between indicators and outcome measures (loyalty and reuse). The result of this study could show the important factors of servicescape and its dimensions, which affect customer satisfaction and service quality.

2. Literature Review

2.1 Servicescape

Kotler (1973), one of the pioneers of the concept of servicescape, defined servicescape as “design of buying environments to produce specific emotional effects in the buyer that enhance his or her purchase probability.” Servicescape evokes emotions that help determine value, which ultimately motivates customers to make a certain choice repeatedly (Arnould et al., 1998).

Bitner (1992) suggests a typology of service organizations based on variations in form and usage of the servicescape, as shown in Fig.1. There are two dimensions capturing differences in the management of servicescape. Level of interaction, the vertical dimension, denotes who mainly performs actions, the customer, the employee, or both.

The level of involvement of customers and employees can be one of the important decision factors in designing a physical environment, and its level may affect the goals and objectives of the organization. The physical complexity of the servicescape, the horizontal dimension, denotes the way that complex elements of the servicescape should be considered in compliance with the various needs of elaborate environments such as hotels and hospitals. Fig.1 suggests different strategic plans, designs, and management for different types of businesses; it is imperative to produce commercially significant actions by consciously designing facilities (Arnould et al., 1998).

2.2 Servicescape Factors

Researchers in the marketing field (Bitner, 1992; Donovan & Rossiter, 1982) have focused on servicescape pleasure extensively. Pleasure in the servicescape can be affected by how customers perceive and feel in relation to the surrounding environment or physical spaces (Ryu & Jang, 2008), and the level of pleasure felt by customers determines their satisfaction and loyalty behaviors (Bitner, 1992; Mehrabian & Russell, 1974).

A significant relationship has been identified between servicescape manipulation and shopping behavior (Turley & Milliman, 2000); it has been found that the role of servicescape is very important in the service delivery process (Hoffman & Turley, 2002).

Ambient factors such as noise, scent, air quality, and cleanliness are not easily recognized by customers because they are below the consumer's consciousness (Aubert-Gamet, 1997), but they contribute to a sense of pleasure in experiencing a service (Baker, 1987). Design factors such as aesthetic attractiveness, layout, and comfort are relatively more perceptible by customers than are ambient factors, and thus they have more impact on customer behavior in the servicescape (Bitner, 1992; Smith & Burns, 1996). Aesthetic attractiveness refers to architectural design, décor, color, etc. Once customers enter a facility, they often observe the interior aesthetics, which is likely to affect their attitudes toward the facility (Baker et al., 1988).

In recent years, numerous studies have attempted to identify and explore the relationship between servicescape factors and customer satisfaction in various service industries such as hotels, retail stores, hospitals, and restaurants. However, the effect of servicescape factors on the behavioral outcomes of the end users of public service facilities is not yet fully understood, and relatively few studies have been devoted to the in-depth evaluation of servicescape in such facilities. Therefore, the relationship between factors and perception indicators for public service facilities is explored in this study because the importance of a particular servicescape factor is apt to be different across different service organizations (Kotler, 1973; Bitner, 1992).

Fig.1. Typology of Service Organizations Based on Variations in Form and Usage of the Servicescape (Adapted from Bitner (1992))
3. Methodology

3.1 Research Method and Procedure

Using a literature review and a pre-survey of the end users of public service facilities, the main servicescape factors for evaluation were identified and finalized. To date, there has been limited research regarding servicescape in public service facilities. Researchers underline the importance of variation in servicescape across different service organizations and facilities (Kotler, 1973; Bitner, 1992; Harris & Ezeh, 2008).

Therefore, apart from the literature review, focus group interviews with facility managers assigned to public service facilities were also conducted to establish the detailed characteristics of each servicescape factor used for service quality evaluation. For focus group interviews, the authors sent official request letters to eight divisions in district facility management corporations that managed community centers, sports complexes, youth centers, and sport and culture centers all together.

Six managers of five divisions participated in the interviews twice, for two hours each, to discuss the appropriateness of items and evaluation methods for public facilities. The items were revised based on service quality measures and previous studies regarding servicescape. For example, for cleanliness, the authors discussed important features in public facilities, checked and confirmed the appropriateness of words concerning items, and checked any missing features that divisions should consider for public facility evaluation or that managers should be concerned about. Through confirmatory factor analysis, the significant factors selected for this research were aesthetic attractiveness, cleanliness, layout, and comfort. The two perception indicators were service quality and satisfaction. The two outcome measures were loyalty and revisit intention.

The public service facilities used in this study were limited to public facilities located in Seoul, and operated and maintained by the Seoul Metropolitan Facilities Management Corporation, where users make full or partial payment to use services. Among the 25 municipal districts of Seoul, four districts were selected: one each from the southeast, northeast, northwest, and southwest. The Jongno, Yeongdeungpo, Mapo, and Gangnam district facility management divisions accepted the request to help with the survey. The five public service facilities selected for this research are shown in Table 1. All showed similar features in providing spaces and programs. They were multipurpose facilities that managed various programs and were used frequently by district residents.

A structured questionnaire was developed and distributed to the users of the five public service facilities and collected during business days and on weekend mornings and afternoons in order to ensure diversity among the responses. The questionnaires were initially checked on-site immediately after they were completed, and in the end 594 valid questionnaires were used for analysis in this study.

3.2 Conceptual Framework and Hypotheses

**Servicescape dimensions**

Bitner (1992) suggested that three primary dimensions of the servicescape are ambient conditions, spatial layout and functionality, and signs, symbols, and artifacts. Service factors that were commonly suggested by Barker et al. (1994), Bitner (1992), Brauer (1992), and Wakefield and Blodgett (1996) were layout accessibility, facility aesthetics, seating comfort, facility cleanliness, and electronic equipment and displays.

Wakefield and Blodgett (1996) focused on built environment in the servicescapes of leisure service settings and investigated the effects of layout accessibility, facility aesthetics, seating comfort, electronic equipment, and facility cleanliness on perceived quality of and satisfaction with the servicescape.

Based on combined insights from the concept of servicescape as defined by Bitner (1992) and the service factors suggested by other researchers (Barker et al., 1994; Bitner, 1992; Brauer, 1992; Wakefield & Blodgett, 1996), pre-survey and focus group interviews with facility managers were conducted in order to define the key variables of servicescape in public facilities. Four main dimensions of public

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**Table 1. Basic Information on the Five Facilities**

| Facility (Built year) | Photograph | Site area | Total floor area | Space type |
|-----------------------|------------|-----------|------------------|------------|
| 1 Jongno community center (2000) | ![Image](1.png) | 3,975 m² | 11,262 m² | *Classroom*<br>*Computer Lab*<br>*Multipurpose rm.*<br>*Meeting room*<br>*Swimming pool*<br>*Fitness center*<br>*Gym*<br>*Aerobics room* |
| 2 Yeongdeungpo Sports Center (2004) | ![Image](2.png) | 2,762 m² | 9,131 m² | *Classroom*<br>*Multipurpose rm.*<br>*Swimming pool*<br>*Fitness center*<br>*Gym*<br>*Aerobics room* |
| 3 Jongno Sport & Culture Center (2007) | ![Image](3.png) | 3,069 m² | 6,756 m² | *Classroom*<br>*Multipurpose rm.*<br>*Meeting room*<br>*Swimming pool*<br>*Fitness center*<br>*Gym*<br>*Aerobics room* |
| 4 Mapogu Seoul Youth Center (2008) | ![Image](4.png) | 1,650 m² | 5,208 m² | *Classroom*<br>*Multipurpose rm.*<br>*Computer Lab.*<br>*Meeting room*<br>*Swimming pool*<br>*Gym* |
| 5 Gangnam Youth Center (1993) | ![Image](5.png) | 2,277 m² | 1,910 m² | *Classroom*<br>*Multipurpose rm.*<br>*Meeting room* |
facility servicescape were finalized for this research: attractiveness, cleanliness, layout, and comfort. **Perceived quality, satisfaction and behavioral intentions**

Bitner (1992) suggested that positive perception of servicescapes is likely to affect approach behaviors (attraction, staying, spending money, and returning). Wakefield and Blodgett (1996) found that servicescape (layout, facility aesthetics, seating comfort, and facility cleanliness) influenced perceived quality, which resulted in higher satisfaction. From the previous research findings, servicescape factors are likely to influence perceived quality and satisfaction.

A well-designed layout has a direct effect on a customer's quality perception and an indirect effect on the customer's desire to return (Wakefield & Blodgett, 1994); comfort has a more favorable impact upon the customer's emotional state as well (Greenland & McGoldrick, 2005).

The surrounding physical environment, that is, the servicescape factors, is considered the main element of perceived service quality and customer satisfaction (Jang & Namkung, 2009; Ryu & Han, 2010). Some previous research findings have also revealed that physical environment influences not only users' evaluations of service quality but also their behavioral responses (Berry & Wall, 2007; Jang & Namkung) and that customer satisfaction is a significant predictor of behavioral intention (Ryu & Han, 2011). Therefore, from the literature, the following hypotheses were drawn:

- **H1a-H1b**: There is a direct relationship between attractiveness and a) service quality and b) customer satisfaction.
- **H2a-H2b**: There is a direct relationship between cleanliness and a) service quality and b) customer satisfaction.
- **H3a-H3b**: There is a direct relationship between layout and a) service quality and b) customer satisfaction.
- **H4a-H4b**: There is a direct relationship between comfort and a) service quality and b) customer satisfaction.

Wakefield and Blodgett (1996) also found that higher satisfaction resulted in higher repatronage (loyalty) and longer stays. Lucas (2002) found that servicescape factors influenced satisfaction and that satisfaction resulted in repatronage intentions, the desire to stay, and recommendations. Much of the previous research has mentioned a significant relationship between customer satisfaction and loyalty (Chi & Qu, 2008; Cronin et al., 2000), and the direct effect of customer satisfaction on loyalty has proven to be statistically significant (Han & Ryu, 2009). Therefore, it is reasonable to expect that there will be positive relationships among servicescape factors and customers' perceived service quality, satisfaction, and behavioral intention (loyalty and revisit intention).

Following a review of servicescape factors in the literature, the hypotheses for this research are proposed and summarized in Fig.2. Similar to other servicescape models, the authors' model includes quality and satisfaction as key perception indicators that are affected differently by the selected four factors and shows how perceived indicators are associated with outcome measures.

**3.3 Data Collection and Analysis**
Focus group interviews were carried out to determine the important factors that could affect the service quality of and user satisfaction with public facilities. Prior to the survey, a pilot test was conducted to ensure the clarity, readability, and ease of understanding of the questionnaire items. The questionnaire was revised in accordance with the results. A total of 594 questionnaires were collected and analyzed using a five-point Likert scale (1 = disagree completely; 5 = agree completely).

The data were analyzed using SPSS 18 and Lisrel 8.54. Confirmatory factor analysis and structural equation modeling (SEM) were conducted to test the proposed hypotheses.

**4. Result**

**4.1 Respondent Characteristics**
The general characteristics of the participating respondents are summarized in Table 2. There were more female (87%) than male respondents (13%) participating in this study. One hundred eighty-five people were in the 30–39 age range, representing 34.5%, followed by 101 people in the 40–49 age group (18.8%). Respondents younger than 20 years old were found more in the youth center. Nine different jobs were identified; 326 respondents were homemakers, representing 55.3%, followed by students (19.9%).
Among the respondents, 47.7% were college graduates and 25.5% were high school graduates. A similar number of respondents participated from each of the five public service facilities, as shown in Table 2.

### 4.2 Reliability Tests and Confirmatory Factor Analysis

Confirmatory factor analysis was used to test a measurement model, employing maximum likelihood estimation. Results showed a moderately good fit for the measurement model. The following indices were calculated: $\chi^2$ (chi-square), CFI (comparative fit index), GFI (goodness of fit index) and NFI (normed fit index), and RMSEA (robustness of mean squared error approximation).

The ratios of the obtained chi-square values to their degrees of freedom ($\chi^2 = 299.74, df = 158$) were acceptable. Other indexes including GFI, 0.92; CFI, 0.99; and RMSEA, 0.042 (see Table 3.) were acceptable. The reliability coefficients (Cronbach's alphas) were all higher than 0.70 except for the comfort factor (0.617), which was higher than the minimum level of 0.6 suggested by Peterson (1994). Factor loadings of each individual indicator with its respective construct reached significance ($p < 0.01$) and had no negative values. Such factor loadings can be considered "practically significant" at .50 or greater (Hair et al., 1998).

| Constructs and measurement items | Standardized item-Construct loading |
|----------------------------------|----------------------------------|
| Attractiveness ($\alpha = .827$) | Attractive interior finishes and colors 83 |
| Attractive interior environment 71 |
| Attractive architecture 65 |
| Interesting sporting equipment and facilities 77 |
| Uplifting sporting devices and equipment 87 |
| Cleanliness ($\alpha = .853$) | Clean facilities 88 |
| Clean entrances and corridors 80 |
| Clean restrooms 71 |
| Layout ($\alpha = .816$) | Ease of locating designated places 70 |
| Ease of access to participate in programs 69 |
| Easy access to restrooms 67 |
| Comfort ($\alpha = .617$) | Comfortable indoor air 66 |
| Comfortable temperature 62 |
| Comfortable brightness 53 |
| Loyalty ($\alpha = .868$) | Talk to others about good quality of the facilities 74 |
| Recommend friends to use the facilities 81 |
| A feeling of belonging to the facilities 64 |
| Time spent in the facilities is an important part of life 64 |
| Recommend that acquaintances use the facilities 82 |
| Satisfaction ($\alpha = .900$) | Considered the decision to use the facilities very good 90 |
| Satisfied with use of the facilities 80 |

Unconstrained model: $\chi^2 = 299.74$ (df = 158); RMSEA = 0.042, P-value = 0.0, GFI = 0.95, CFI = 0.99, NFI = 0.98

*b: Cronbach's alphas are in parentheses
*b: All loadings are significant at $p < 0.01$

### 4.3 Structural Model Testing and Hypothesis Testing

Once the measurement issues were addressed, the proposed model for the current study was tested using structural equation modeling (SEM). The initial model failed to show a good fit ($\chi^2 = 1019.55, df = 214, p$-value = 0.0, GFI = 0.85, CFI = 0.95, NFI = 0.94, RMSEA = 0.087, and Critical Number = 143.47).

As shown in Table 3., all fit indices for the model exceeded acceptable levels ($\chi^2 = 593.93, df = 199$, $p$-value = 0.0, GFI = 0.91, CFI = 0.98, NFI = 0.96, RMSEA = 0.063, and CN = 219.03).

Among the twelve possible relationships, eight linear relationships were found to be significantly directly related (see Fig.2.). Two servicescape variables were found to be significantly related to service quality. Three servicescape variables were found to be significantly related to satisfaction. The t-statistics from the structural model were used to examine the hypotheses as indicated in the summary of results (Table 4.).
The relationship between attractiveness and service quality was not found to be significant. Attractiveness was also not related to satisfaction. Hypotheses H1a and H1b were not supported.

Cleanliness was found to be positively related to satisfaction. Thus, Hypothesis H2b was supported. The results confirmed Hypotheses 3a and 3b, which predicted that when people have easier access to facilities, they perceive better service quality and feel more satisfaction.

Comfort was found to be positively related to perceived service quality and satisfaction. Thus, Hypotheses H4a and H4b were supported.

As expected, H5—service quality is positively associated with loyalty (H5a) and satisfaction (H5b)—was supported. H6a and H6b were also confirmed. Higher satisfaction was more likely to have higher reuse or revisit intentions.

Table 4. Results of Path Analysis

| Hypotheses | T-values | * | ** |
|-------------|----------|---|----|
| Service quality → Reuse | 0.07 | 1.07 | H1a > 0 |
| Service quality → Loyalty | 0.09 | 1.30 | H2a > 0 |
| Service quality → Reuse | 0.15 | 2.27 | H3a > 0 |
| Service quality → Loyalty | 0.12 | 1.86 | H4a > 0 |
| Service quality → Reuse | 0.19 | 2.29 | H5a > 0 |
| Service quality → Loyalty | 0.27 | 2.41 | H6a > 0 |

5. Discussion

This study investigated the effects of servicescape on perceived service quality and behavioral intention. In particular, the influences of multiple elements of servicescape were explored because of the lack of empirical research on the multiple effects of servicescape. Because previous findings have emphasized specific roles for the elements of servicescapes across various organizations and service facilities, the current study explored and tested the construct of servicescape in public facilities and its relationships between service quality and behavioral outcomes.

Although attractiveness of the physical environment was expected to be an indicator of satisfaction or service quality, the results failed to support a relationship between the attractiveness of the physical environment and service quality or satisfaction. Harris and Ezeh (2008) found that the appearance of staff in the servicescape was positively related to loyalty. They also found that furnishings were a determinant of loyalty. In contrast to the proposition that aesthetic attributes are more tangible than are ambient features and are strong determinants of satisfaction and service quality, the disconfirmation of the proposition could have been the result of the characteristics of the public facilities and the users' expectations of the public buildings. Compared with commercial facilities, public facilities are considered less luxurious, less ornamental, and more function oriented. Users of public facilities are less likely to be concerned about attractiveness than they are about cleanliness, easy layout, and comfort.

The effect of cleanliness of servicescape is consistent with the previous findings. Cleanliness of servicescape is one of the strong indicators of intention to use the service in the future. Vilnai-Yavetz and Gilboa (2010) emphasize that different levels of cleanliness will be expected and perceived as appropriate in different contexts. Especially where functionality and health concerns matter, such as in hospitals, clinics, and hotels, cleanliness is considered critical. In this study, it was also found that cleanliness was very important in public facilities such as community centers, gyms, and sporting complexes in terms of users' satisfaction directly and regarding loyalty and reuse indirectly. It is suggested that cleanliness issues be approached as a matter of motivational factors rather than of hygiene (Herzberg, 1966; Vilnai-Yavetz & Gilboa, 2010).

Easy layout (easy access) was also found to be an important factor for service quality and satisfaction. The facilities and buildings the participants of this study used are large, with many different kinds of rooms and spaces such as multipurpose rooms, meeting rooms, gyms, swimming pools, and libraries. In this kind of large, complex facility, easy layout and accessibility are important for users to be able to use the space. Therefore, managers should recognize accessibility issues and wayfinding strategies.

Comfort has a more favorable impact upon customer emotional state (Greenland & McGoldrick, 2005), and the findings of this study also support the positive effects of comfort on perceived service quality and satisfaction. Despite some limitations of this research, the empirical findings of this research contributed to the expansion of the concept of servicescape.
Future studies need to focus on various elements of servicescape and their roles in specific types of public facilities and organizations. Aside from the influence of physical environmental features, the influence of other service factors such as staff and service delivery also need to be explored together. Furthermore, in addition to the user's evaluation of servicescape, it is important to identify which servicescape variables are considered and valued by other stakeholders including employees, planners, and managers.

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