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Understanding the Internal Structure of the Sense of Place of Daehak-ro Cultural District in Seoul

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ABSTRACT

Sense of place (SOP) has recently been considered an effective strategy through which to pursue sustainable place development. However, many urban spaces have not usually considered the contribution of built-environment factors to SOP and SOP's contribution to people's willingness to revisit for sustainable place. Therefore, this research aims to understand the internal structure of SOP at Daehak-ro, one of the most famous cultural district and tourism sites in Seoul, Korea. Through this study, the sociocultural factor was found to make the greatest contribution to Daehak-ro's SOP, and SOP was itself found to be highly related to willingness to revisit. These results suggest that non-physical factors could be most important to developing an SOP in urban environments. This study will eventually lead to better understanding of developing SOP, and will contribute to Daehak-ro becoming more sustainable than at present.

Keywords *Sense of Place, Sustainable Place Development, Structural Equation Modeling, Tourism, Daehak-ro*

1. Introduction

Throughout the world, places are under threat, struggling to ensure the survival and sustainability of their sense of place (SOP), their authenticity, and, most fundamentally, their community (Binder, 2008). This threat derives from a lack of structural understanding of what constitutes SOP, and of what diverse experiences possibly exist between places and visitors (Kwon, 2013). With external pressures placed upon communities by inherent micro and macro-economic demands, preservation of SOP is critical to managing the inevitably resulting changes.

In this era of quantitative growth, the SOP is considered an important component in creating a "livable city" for residents (Carmona et al., 2003; Choi, 2008; Korea Land Corporation, 2002).[1)] In addition, in discussions about sustainability and quality of life, providing an SOP to urban residents and visitors has also become both an important topic among planners, designers, and policy makers, and an important driver within urban development policies in certain municipalities (Kwon, 2013; Moon, 2014).

However, many professionals' efforts to preserve or produce SOP in locations where cultural artists assemble through redevelopment projects have not always succeeded, as humane characteristics become lost through rapid growth and commercialization (Joo and Kim, 2010; Kim, Suh and Choi, 2014).

This is likely because such projects were conducted without an in-depth, structural understanding of which built-environment factors constitute SOP, and the possibilities for diverse experiences between places and people. Conventionally established SOPs, coupled with frequent attempts to introduce planning and design elements without any empirically validated evidence that they will contribute to SOP, have failed to generate valuable outcomes. Some of these projects have destroyed existing SOPs and encouraged undesirable uses, such as a commercialization.

Given these circumstances, this study was conducted to seek to understand the internal structure of

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1) The effectiveness of the new quantitative studies has also been controversial because their analysis tends to be mechanical and oversimplified. Additionally, SOP could not be completely analyzed because of the multidimensional meaning of a place and the lack of attention to daily experiences related to the SOP (Relph, 1976; Krupat, 1983; Shamai, 1991; Lalli, 1992; Jorgensen and Stedman, 2001).

SOP in terms of the objectively relationships between "Built Environment", "SOP" and "Willingness to Revisit" from visitors' perspectives, thereby facilitating the planning of sustainable places properly considering the SOP.

This research will apply structural equation modeling (SEM) – a widely used statistical method in psychology, sociology, and business administration – to analyze the internal structure of SOP objectivity in Daehak-ro, one of the most famous cultural district and tourism sites in Seoul, Korea.

2. Literature Reviews

2.1 Studies of Sense of Place

Recently, the city has been considered a place in which physical space mingles with human behavior, and the understanding of city culture and landscape, that are emerged by the process of combining, were emphasized (Heo and Park, 2009). To understand the SOP, a perspective of cultural landscape should be considered, as this perspective provides the capacity for understanding its meaning and essence of culture (Lee, 2010).

Research on SOP has been conducted separately through either qualitative or quantitative studies, commonly through mutual discussions about perspectives on SOP.

Tuan (1979), in a representative qualitative research on the SOP, began to examine the concepts of place and SOP. Prior studies have mainly considered theoretical aspects, such as the concepts and definitions of SOP, while some research has also focused on identifying the phenomenological qualities of places based on existential philosophy. Based on the qualitative studies, it was contended that place should be studied in terms of its role in human life and experience, rather than its formulation within a formal science of geography. Relph and Tuan, who advocated qualitative research on the formation of SOP, grew dissatisfied with the theory of environmental image supported by the logical positivism methodology, such as statistic techniques, that was mainstream in the 1970s. Relph and Tuan argued that positivist methodologies were not suitable for understanding the meaning of a space and place, and that the study of SOP should focus on the essential understanding of its concept and meaning based on phenomenological and experiential factors (Shim, 2005).

Therefore, many researchers who emphasized the importance of qualitative research methods conducted several studies of the structure of the SOP based on the phenomenon in place. Relph (1976) described the internal SOP structure as comprising four components: the place's "physical setting," "activities", "meaning", and "spirit". Relph argued that it was very difficult to clearly distinguish the relationship between the four components, and that the correlations among them were very important in forming the SOP. Steele (1981) claimed that SOP formation occurs due to a psychological correlation between "people" and their "physical and social environments". Steele perceived that SOP is analogous to a series of people's responses to their environment; these responses are unconscious rather than conscious perceptions of that environment. Greene (1996) explained that the SOP is formed by people's psychological interactions with "physical", "social", and "managed environments". In addition, Greene argued that SOP could be developed for making a place and could be utilized as a resource for tourism. Lee (1998) contended that SOP is determined by people's responses to the special environment used as a frame for their daily lives. In this respect, the SOP and spirit of a place were linked to individual and collective aspects respectively. Lee described SOP as forming through the interaction between "people" and "their surroundings" and also contended that the most basic components in SOP formation were the unique atmosphere represented by humans and land, the "physical characteristics" of the place, and the "meaning" and "value" formed by people in response to their surroundings. Baik (2004) argued that SOP could be formed through visual perception and repeated experience. Baik also emphasized that, since the concept of place no longer exists as the foundation of human existence, the SOP should be reassessed as the means for regional development and re-evaluated as an aggressive marketing tool. Therefore, Baik emphasized that the SOP could provide an important basis for planning cultural art festivals. Hong, Park, and Im (2011) reported that SOP formation occurs in conjunction with temporal and spatial characteristics and accumulated experience. Furthermore, the SOP has components such as "space", "time", "experience" and "meaning" (3-dimensions); it is represented by the experiential and semantic characteristics possessed by a place, in which the "meaning" is generated and accumulated through people's direct experience with time (5-dimensions) and through human behaviours between the spaces (4-dimensions).

Meanwhile, Lee (2003) contended that interpretations of place and SOP through phenomenological methods of geography are quite abstract and declarative. Therefore, environmental planning and design have depended heavily on expert intuition commonly lacking a rationale of SOP. In this respect, Kwon et al. (2011) also noted that the qualitative research methodology for the SOP has been criticized because for not having a specific methodology or conceptual framework to express subjective meaning and

for failing to reflect aspects of the actual social structure.

Recently, to overcome the limitations of qualitative research methods, various quantitative research approaches to understanding SOP have been considered. Representative of the studies were focused on evaluating the relationships between place attachment and place identity as a parameter of the SOP[2]. To date, quantitative studies have investigated the structure of SOP, using various statistical methods. Among the quantitative methodologies, structure equation modeling (SEM) has been utilized commonly in this field. Jorgensen and Stedman (2001) defined the SOP as a multidimensional construct comprising "beliefs about the relationship between self and place" and "feelings toward a place". To quantitatively analyze the structure, a 12-item SOP scale − consistent with place attachment, place identity, and place dependence − was tested as the parameters for evaluating the SOP through SEM. Jorgensen and Stedman derived the internal SOP structure by substituting the results with five hypothetical internal SOP structures from previous studies. Deutsch, Yoon, and Goulias (2013) explored the relationship between travel behavior models in shopping malls, identifying six distinct factors representing unique dimensions of SOP: attachment, dependency, identity, satisfaction, atmosphere, and community. Shim and Lee (2008) investigated the SOP perception difference associated with tourists' visit patterns. They noted that contact time and interaction had a significant effect on the SOP, and the experience formed in the course of travelers' preparations had an impact on the tourist site. Kim (2010) derived and verified the components associated with the experiences of major sightseeing destinations and SOP in the modern sightseeing industry, aiming to investigate whether sightseeing narratives affected the structural causal relationship between the SOP and the tourism experience. The results indicated that sightseeing narratives and people's tourism experience had a positive effect on SOP formation; Kim, therefore, suggested that easier accessibility and efforts to better manage various historic cultural facilities could be promoted to maximize the marketing effects of a tourist destination. Lee and Choe (2011) classified an SOP component in an area near Hongik University, a popular club-culture location in Seoul. After reviewing the conventional theory of the construct, Lee and Choe described a theoretical model for the correlation and constructed a causal structure model of place identity. Their results demonstrated that physical, active, and human components had significant effects on place identity through their interactions.

Through reviewing previous qualitative and quantitative studies on the internal SOP structure, the existence of conceptual differences among researchers was noted. All of them worked toward identifying the correlations between people and built environments based on the theoretical aspects represented by place and SOP. They then derived the internal SOP structure, encompassing diverse places, ranging

Table 1. General factors of the SOP according to prior research

Researcher	SOP factor			
Relph (1976)	Settings	-	Activities	Meanings, genius Loci
Steele (1981)	Surroundings (physical factors)	Context (social factors)	-	Person (psychological factors)
Greene (1996)	Physical setting, managerial setting	Social setting	-	Person
Lee (1998)	Setting		-	Person
Jorgensen and Stedman (2001)	-	-	-	Place identity, place attachment, place dependence
Baik (2004)	Physical · environmental	Human social	Relative	Emotional · symbolic
Shim and Lee (2008)	Natural environment	Historical remains, social economy	Hominid activity, sightseeing	Symbol, emotion
Deutsch, Seo, and Goulias (2013)	-	Community	-	Identity, attachment, dependence, satisfaction, atmosphere
Hong, Park, and Im (2011)	Space	Time	Behavior	-
Kim (2010)	Physical · environmental	-	Experiential · active	Emotional · symbolic
Lee and Choe (2011)	Physical factors	-	Active factor	Human factor
	⬇	⬇	⬇	
General factors	Physical factor	Sociocultural factor	Experiential factor	

Source: Im, et al., 2014

2) Beyond the materiality of place, the SOP suggests social, cultural, and psychological approaches constructed by human, such as place relationship, representing the affective, positive, and emotional bonding of human beings with places as a means to understand the place (Relph, 1976; Schumaker and Taylor, 1983; Tuan, 1974, 1977).

from a city to a regional community, which were consistent with place identity, place attachment, and place dependency as the SOP's subordinate concepts. In the final phase, the internal structures of SOP were analyzed statistically.

In addition, several studies were considered to have some limitations in their application to environmental planning for sustainable place development, having only examined the impacts of the environmental sub-components in the structure of SOP. As such sub-components as place identity, place attachment, and place dependency were merely phenomenological concepts, it has, therefore, been difficult to apply them within environment planning. Furthermore, several previous several studies exploring the internal structure of SOP applied different components and measurement items. This inconsistency has been considered an obstacle to deriving a general method for researching the internal structure of SOP. Therefore, the internal structure of SOP should be derived to apply generally by first referencing previous studies. By reviewing the previous studies on the internal structure of SOP, the components of SOP were found to comprise physical, sociocultural, and experiential built-environment factors; these have effectively been used in this study to derive the generalized internal structure of SOP (Table 1).

2.2 Studies of SOP Evaluating Adjectives

The adjective evaluation method has been widely used since the firm establishment of the landscape appraisal theory. The method is designed to identify an object's characteristics, rather than its quality (Im 2009; Zube, Bruch, and Fabos, 1973). Like the landscape appraisal theory, the SOP is also a psychological response to the environment. Moreover, as the average person is not usually familiar with the term SOP, it became recognized that they would experience difficulties if asked to rate the term. Therefore, adjective evaluation came to be considered an appropriate surrogate method for describing the characteristics, meanings, and images of SOP.

Shin and Choi (2010) constructed an SOP adjective list to explain the characteristics of SOP in the Hongik University area, are presentative club performing culture area in Seoul. To construct the list, they conducted an open survey asking ordinary people about the image of the Hongik University area. From their findings, twenty-six adjectives were selected. Im et al. (2011) selected the vocabulary as a parameter for determining a location's SOP for the purpose of analyzing the distribution of SOP in five Korean cities: through reviewing previous studies and conducting a preliminary survey, the terms of "to give a good impression, meaningful and memorable" were selected. Kwon, Jung, and Im (2011) developed an index of adjectives for measuring SOP. To construct the list, they conducted an open survey of professionals associated with the space and place field. Through this process, 20 preliminary adjectives were derived. By analyzing the average value and variances of the data used to evaluate the relevance between the SOP and the preliminary adjectives, a total of eight adjectives (characteristic, unique, affectionate, meaningful, important, attractive, traditional, and familiar) were finally selected. The list's reliability was fully verified, with a Cronbach's alpha value of 0.821confirming its internal consistency. Kang and Choi (2012) formulated adjective factors to understand the characteristics of SOP at Hongik University. To determine the factors, a literature review and preliminary statistical investigation were conducted around the Hongik University area. Through this process, seven factors were identified: art-interest, discursive, vitality, strong, characteristic, attraction, and chaotic. Im, Kang, and Choi (2013) constructed adjective factors to understand the characteristics of SOP at Daehakro, a presentative performing culture area in Seoul. To determine the factors, they conducted a literature review and preliminary statistical investigation in Daehakro. The eight factors they identified comprised: art-creation, vitality, strong, characteristic, chaotic, discursive, attraction, and peculiar

Many of the previous studies using this methodology have developed groups of adjectives designed to evaluate and understand only in the specific SOP location investigated in each particular study. Therefore, the generalizability of those previously developed adjective indexes to all SOPs is considered to be limited. However, unlike the other studies, Kwon, Jung, and Im (2011) statistically derived a group of adjectives to evaluate diverse types of places in Korea. Moreover, the adjective index of SOP they first formulated has been verified and utilized in various quantitative studies related to SOP in Korea. For this reason, the adjective index of SOP was applied for evaluating the SOP in this research.

3. Methods: Structural Equation Modeling (SEM)

SOP is a complex concept, formed by the interactions of people with their surroundings. To investigate the fragmentary and latent variables among SOP-related factors, SEM was used in this study. SEM was deemed appropriate because it could elucidate relevant factors and their impacts in the internal SOP structure. SEM, which is widely used in psychology, sociology, and business administration, is a multivariate technique incorporating observed (measured) and unobserved vari-

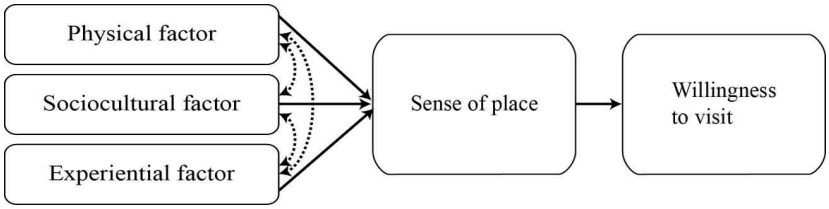


Fig. 1. Study hypothesis model of the internal structure of SOP

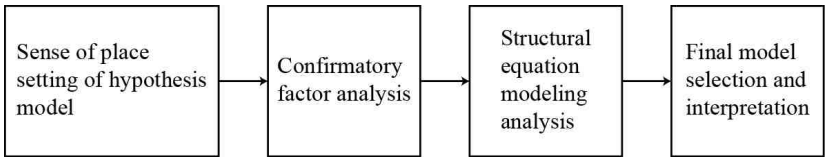


Fig. 2. A series of steps to analyze the internal structure of SOP

ables (latent constructs); moreover, it is one of the most efficient and reliable statistical approaches. Traditional methods (e.g., univariate, correlation, regression, factor, and discriminant) have been proposed to estimate the relationship between the variables, but these techniques have disadvantages in that only fragmentary relationships between variables can be analyzed (Kim, Hong, and Kim, 2009).

In contrast, SEM can use diverse analytical methods − such as regression, factor, multiple regression, and multivariable − simultaneously. In addition, the technique can test the causal relationships between variables offered by other statistical methods and enables researchers to investigate the relationships among variables, rather than just the fragmentary relationships (Tabachnick and Fidell, 2001).

To derive the internal SOP structure using SEM, a hypothetical SOP model was first established, based on the rationale behind the internal structure derived from previous studies. A survey was then conducted based on our hypothetical SOP model, and the resultant data were evaluated through confirmatory factor analysis (CFA) and SEM. Finally, the final model was selected and interpreted (Fig. 1).

With the research hypothesis that physical, sociocultural, and experiential factors would affect SOP formation in the internal SOP structure, we also investigated the "willingness to visit" model to estimate the impact of SOP-related environmental planning and design on ordinary people (Fig. 2), hypothesizing that it would be significant.[3)]

To derive the internal SOP structure for Daehak-ro, we surveyed 280 people between March 25 and 26, 2011, and evaluated the results using a 7-point Likert scale (Tables 2 and 3).

Table 2. Summary of survey

Date	Survey item	No. of surveys distributed	Response rate
March 25-26, 2011	• Satisfaction with street environment components • Adjective index for the SOP • Evaluation of willingness to Visit	280	100%

Table 3. Demographics of survey respondents

Category		Number of respondents	Percentage of respondent sample
Gender	Male	134	47.9
	Female	146	52.1
Age	20s-30s	252	90.0
	40s-50s	27	9.6
	Over 60s	1	0.4
Frequency of visit	More than once a week	63	22.5
	More than twice a week	29	10.4
	More than twice a month	95	33.9
	Less than once a month	93	33.2

3) Steele (1981) argued that when one is aware of what components are contained within an SOP, one could derive a better experience, with greater impact, from a place. Good experience was attributed to a place that brought higher satisfaction in the individual experiencing the place. The SOP scale for physical, sociocultural, and experiential factors should be evaluated according to the level of satisfaction (Kwon et al., 2011).

Hypothesis 1. The physical, sociocultural, and experiential factors of a place are correlated, and these factors will have a significant impact on SOP formation.

Hypothesis 2. SOP formation will have a significant impact on "willingness to visit".

4. Results and Discussions

4.1 History and Characteristics of Daehak-ro

Daehak-ro (literally meaning "university street") is designated as a cultural district by the Seoul Metropolitan Government; it was formerly known as Sunggyobang, meaning "high respect for teaching". As its former name indicates, Sungkyunkwan, the Joseon Dynasty's foremost national education institution, was located in this area from 1398 until the early 20th century. Since then, many premier universities have been established, such as Gyeongseong Imperial University in the Japanese Colonial era and the prestigious Seoul National University following Korean independence. Because of this history, Daehak-ro has been developed and maintained as a representative symbol of young people in Seoul.

After Seoul National University moved out of this area in 1975, the city government established a plan to construct an upscale housing complex. However, confronted by discontent from members of the public

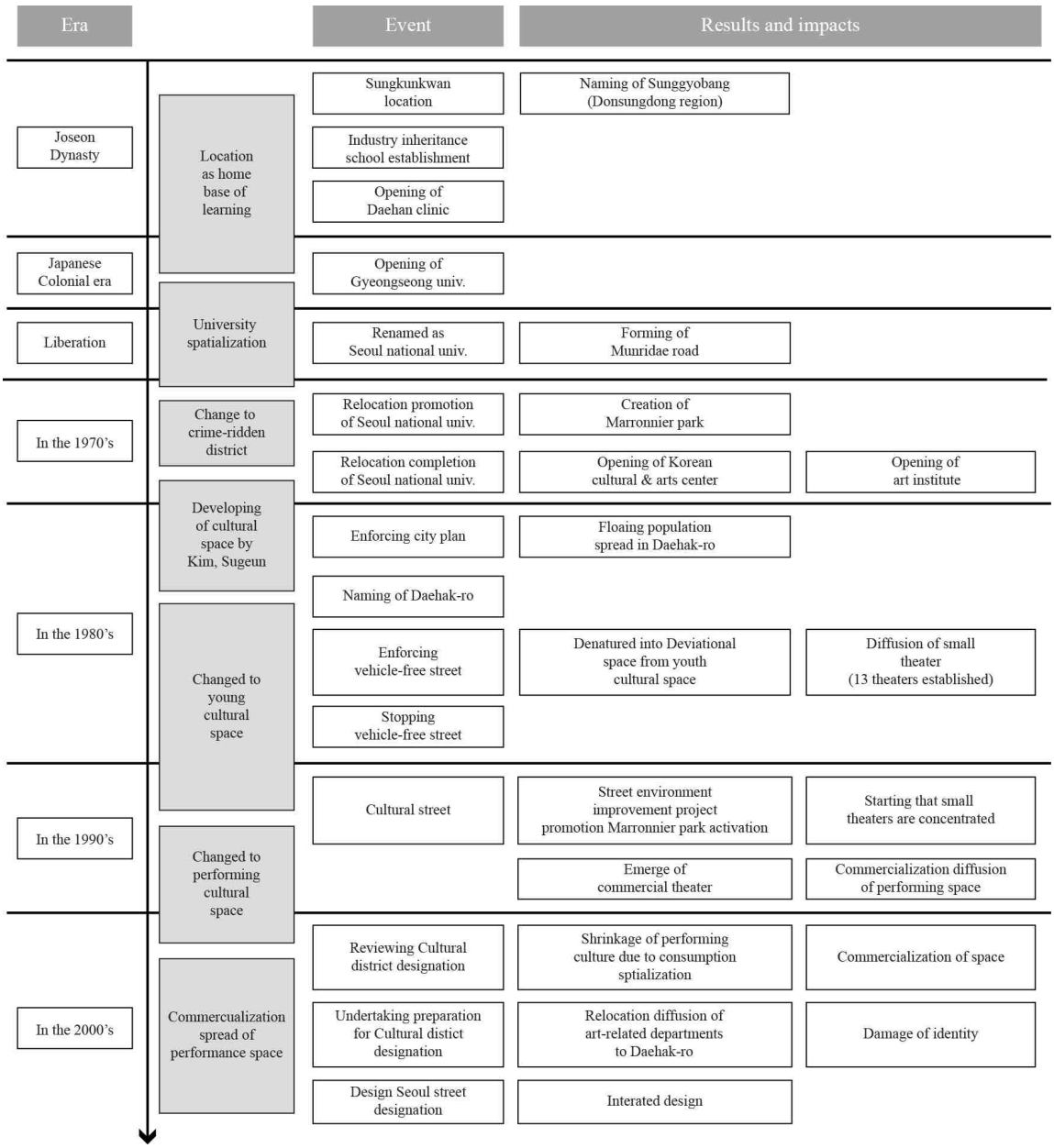


Fig. 3. Historical development of Dahak-ro

Table 4. Components of built environment in Daehak-ro

Division		Components
Physical factor	Architectural factor	Size (building size, height, etc.), Architectural form (Hanok, exterior design, etc.), materials (color), etc.
	Street factor	Size (scale, width, etc.), Form (pavement, pattern, etc.), facility, etc.
Non-physical factor	Sociocultural factor	Management and administration, type of business, merchandise, forming history, etc.
	Experiential factor	Experiential program, watch program, etc.

demanding more cultural spaces in Daehak-ro, the city government changed its plan. Finally, it decided to create the culturally driven Marronnier park, having realized its earlier neglect of cultural development while focusing on rapid economic development. Since the park's establishment, more than 30 performing arts theaters have opened therein. After that, the city government designated this area as a "street of culture and art" and named it "Daehak-ro" in 1985. Daehak-ro is easily accessible by subway. The 700m-section between Ewha crossroads and Naksan garden is designated as "pedestrian only" at weekends. The later introduction of cars brought a drastic increase in the number of visitors and prompted small theaters in Sinchon district to move into Daehak-ro because of cheaper rents and convenient transportation. Daehak-ro became a street for the youth and a center of culture true to its reputation. After Daehak-ro was designated as a "street of culture" in the latter half of the 1990s and underwent a program of regeneration, Marronnier park became a lively, spacious outdoor stage, offering a diverse range of cultural events and festivals. In the new millennium, various university-affiliated organizations specializing in arts, culture, movies, pictures, and designs have also moved to Daehak-ro. This history of Daehak-ro has contributed to the making of a cultural arts space (Fig. 3).

While numerous performances are held in Daehak-ro every day, the area has become full of cafes, restaurants, and game rooms. This trend has transformed the cultural district into an entertainment venue. The number of visitors who wish to enjoy diverse performances, however, is gradually falling. Notably, the price of real estate is showing signs of an upturn. If such unfavorable trends toward performing arts persist, the cultural space of Daehak-ro will eventually disappear. The general consensus is that government-level policy interventions are necessary to maintain and develop the cultural district filled with theatres. Although the city government prioritizes financing cultural art organizations, including small theaters, and renovating street environments, the short-sightedness of these policies have been criticized (Lee, 1998; Korea Cultural Policy Institute, 1999; Seoul Development Institute, 2005; Hong and

Table 5. Satisfaction with components of the street environment of Daehak-ro

Components of street environment			Average	Standard deviation
Physical factor	Architectural factor	Architectural form	4.44	1.17
		Building size	4.44	1.12
		Building height	4.46	1.17
		Building materials	4.45	1.20
		Building color	4.23	1.33
		Outdoor advertisements	3.58	1.41
	Street factor	Form of street	4.07	1.28
		Scale of street	4.23	1.24
		Type of street	4.06	1.38
		Paving of street	4.01	1.31
		Facility of street	3.94	1.28
		Planting and green belt	4.06	1.39
Non-physical factor	Sociocultural factor	Management and administration	3.95	1.66
		Goods	3.99	1.27
		Type of business	4.18	1.38
		Formation history	4.30	1.25
	Experiential factor	Experiential program	4.57	1.49
		Watch program	4.96	1.43

Table 6. Evaluation the adjective index of SOP

Index		Average	Standard deviation
Adjective for measuring the SOP	Characteristic	4.74	1.31
	Unique	4.65	1.19
	Affectionate	4.29	1.18
	Meaningful	4.52	1.37
	Important	3.79	1.35
	Attractive	4.88	1.28
	Traditional	4.53	1.33
	Familiar	4.12	1.49
Adjectives for measuring the willingness to visit	Walking desirable	4.65	1.45
	Revisit desirable	4.96	1.33

Kim, 2005; Lee, 2008). Nevertheless, Daehak-ro remains regarded as one of the places in Korea with a relatively higher SOP because of its inherent historic characteristics. Fig. 4 depicts the general landscape of Daehak-ro.

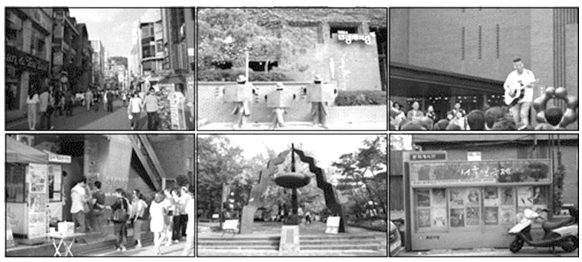


Fig. 4. General landscape of Daehak-ro

4.2 Built Environment in Daehak-ro

To achieve the research purpose, the built-environment components should be selected through the literature review and on-site survey. In fact, the components of built environment could be more compartmentalized by various perspectives of prior research. Given that the research's purpose is to examine the internal structure of SOP by ordinary visitors, the elements of built environment should be selected with reference to accessibility, such as being easy to perceive and experience. Therefore, the components of built environment identified in Table 4 were selected for this research.

4.3 Selection and Evaluation of Built Environment Components in Daehak-ro

Results regarding satisfaction with components of the street environment in Daehak-ro showed relatively high scores for "building height" (4.46) and "building size" (4.44) as physical factors. Other factors, such as "watch program" (4.96), "experiential program" (4.57), and "formation history" (4.30), obtained scores that were as relatively high as the scores for non-physical factors (Table 5).

4.4 Evaluation the Adjective Index of SOP and Willingness to Visit

The average individual scores for the SOP-related adjectives evaluated in this study are detailed in Table 6 below. In the evaluation measuring the willingness to visit model, adjectives such as "revisit desirable" (4.59) and "walking desirable" (4.65) were compared; thus, "revisit desirable" was more favored than "walking desirable" (Table 6).

These results indicate that Daehak-ro is an attractive, individualistic, and unique place for the public because of its inherent characteristics as a cultural space for performing arts. In addition, Daehak-ro could be considered a place favored by ordinary people, with a higher score in the "revisit desirable" model.

Table 7. Final measurement factors and index in the internal structure of the SOP of Daehak-ro

Measurement factor	Measurement index
SOP	Characteristic, unique, affectionate, meaningful, important, attractive, raditional, familiar
Physical factor	Building form, building material, building color, scale of street, paving of street
Sociocultural factor	Management and administration, goods, type of business, formation history
Experiential factor	Experiential program, watch program
Willingness to visit	Willingness to walk, willingness to revisit

Table 8. Statistical test on the internal structure of the SOP of Daehak-ro

Hypothesis	Path	Path coefficient	Standard error	Adoption
	Physical factor → sense of place	0.20**	0.078	O
1	Sociocultural factor → sense of place	0.32**	0.080	O
	Experiential factor → sense of place	0.41**	0.150	O
2	Sense of place → willingness to visit	0.76***	0.101	O

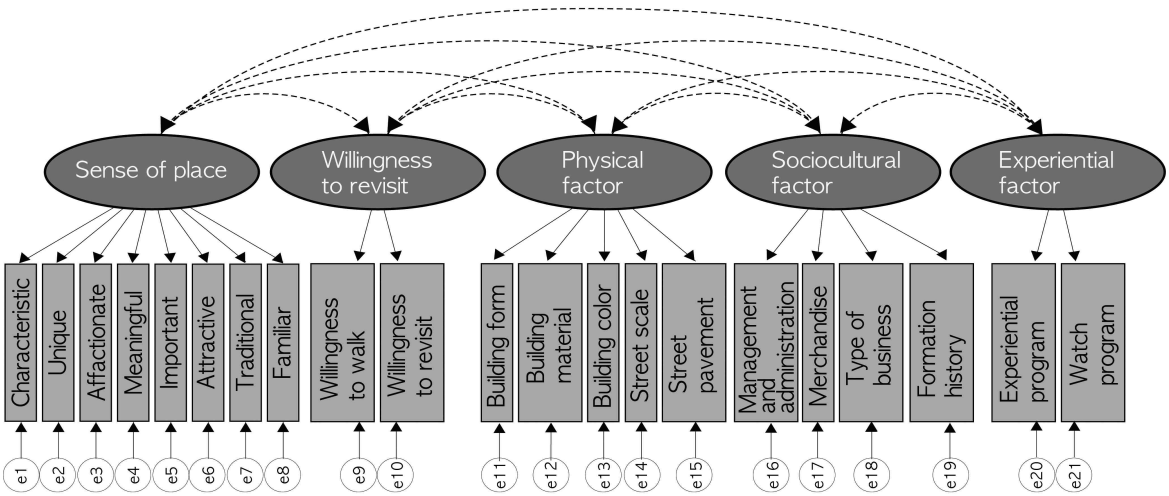
$^{**}p < 0.05$ $^{***}p < 0.001$
$x^2(182) = 472.0$ ($p = 0.000$); RMSEA = 0.076; SRMR = 0.0669; NNFI (TLI) = 0.814; NFI = 0.842; GFI = 0.860; AGFI = 0.823; CFI = 0.839

4.5 Internal structure of SOP for Daehak-ro

The results of the adjective index of SOP, the willingness to visit model, and satisfaction with the components in the street environment were subjected to CFA through the maximum likelihood (ML.) test. Values for each parameter were separated into "SOP," physical, sociocultural, and experiential factors related to the components in Daehak-ro and the "willingness to visit" model (Fig. 5), with large path coefficients or standard deviations in valuable items being deleted. The SOP scale for the final CFA in the internal SOP structure for Daehak-ro was expressed by x^2 (41) = 114.4 (p = 0.000); NNFI (TLI) = 0.860; NFI = 0.849; GFI = 0.930; AGFI = 0.888; CFI = 0.896; RMSEA = 0.080; and SRMR = 0.0634. The results suggest that these values are suitable. Each factor was therefore used to measure the SOP index in the internal SOP structure modeling proposed by this study (Table 7).

Based on the results of this study, the internal SOP structure for Daehak-ro was analyzed using the ML. method of SEM. The index of SOP in the internal SOP structure for Daehak-ro was as follows: $x^2(179) = 468.4$ (p = 0.000); NNFI (TLI) = 0.811; NFI = 0.842; GFI = 0.861; AGFI = 0.821; CFI = 0.839; RMSEA = 0.076; and SRMR = 0.0656. Thus, the results suggest that the proposed internal structure of SOP for Daehak-ro was suitable (Table 8, Fig. 6).[4)].

The study of Hypothesis 1 revealed that physical, sociocultural, and experiential factors were correlated, and had a significant impact on the internal SOP structure for Daehak-ro (physical factor: 0.20, p <0.05; sociocultural factor: 0.41, p <0.05; and experiential factor: 0.32, p <0.05). Notably, the sociocultural factor in the internal SOP structure for Daehak-ro was more influential than both the experi-



$x^2(41)=114.4(p=0.000)$, $^{**}p < 0.05$, $^{***}p < 0.001$,
NNFI(TLI): 0.860, NFI: 0.849, GFI: 0.930, AGFI: 0.888, CFI: 0.896, RMSEA: 0.080, SRMR: 0.0634

Fig. 5. Result for confirmatory factor analysis

4) The indexes in this study – such as NNFI(TLI), NFI, GFI, AGFI, and CFI – were slightly lower than 0.9 on the recommended scale (Gefen, Straub, and Boudreau., 2000), but they were nonetheless at a suitable level exceeding 0.8 on that scale (Chau, 1996; Taylor and Todd,1995). Though the RMSEA value (Steiger, 1990) and the SRMR value (Jŏreskog and Sŏrbom, 1989, 1993) were below 0.1 and 0.08 respectively, the SOP-related index met their recommended levels.

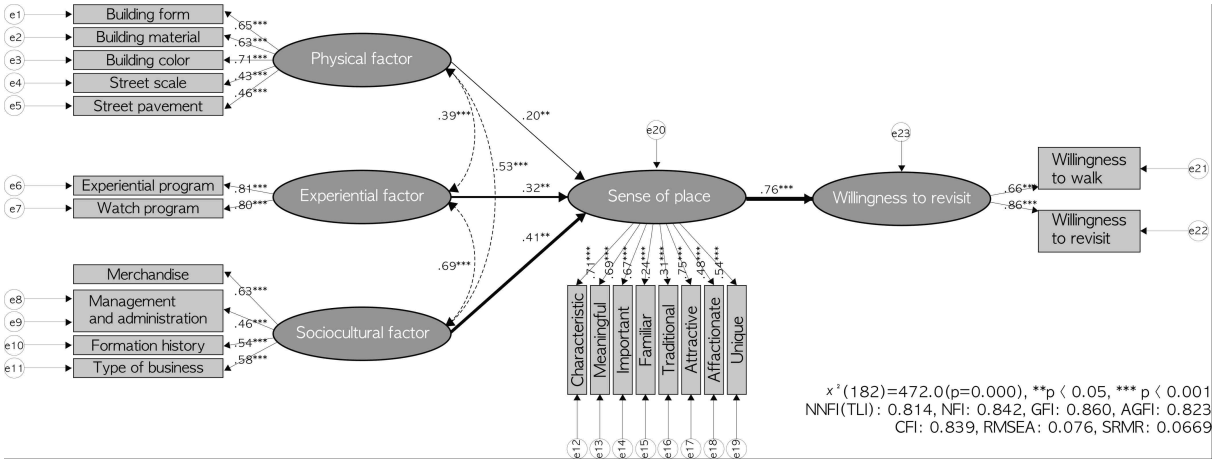


Fig. 6. Internal structure of the SOP for Daehak-ro

ential and physical factors. This finding suggests that when planning for Daehak-ro's SOP, more emphasis should be placed on the "sociocultural factor" before focusing on physical forms and programs.

While the physical factor was shown to be the least influential in the SOP formation for Daehak-ro, its high correlation with the sociocultural factors should not be overlooked. In this context, when the environmental plan and design for Daehak-ro are established, the physical factor incorporating the sociocultural factor should take into account. With this in mind, the physical factor may be more influential in the internal structure of SOP for Daehak-ro.

The study of Hypothesis 2 also shows that the SOP formation for Daehak-ro significantly affected the willingness to visit (0.79, $p < 0.001$) model. This result implies that increasing awareness of Daehak-ro's SOP further increases its appeal as a place to revisit.

In the internal structure of SOP for Daehak-ro, the regression coefficients from the SOP-related index associated with the physical factor measurement model were "building color" (0.71), "building form" (0.65),"building material" (0.63), "street paving" (0.46), and "scale of street"(0.43). The regression coefficients related to the sociocultural factor were "goods" (0.63), "type of business" (0.58), "formation history" (0.54), and "management and administration" (0.46). The regression coefficients related to the experiential factor were "experiential program" (0.81) and "watch program" (0.80). The regression coefficients of the eight-adjective index of SOP, representing the index of the SOP measurement model, were "attractive" (0.75), "individualistic" (0.71), "meaningful" (0.69), "critical" (0.67), "unique" (0.54), "affectionate" (0.48), "traditional" (0.31), and "familiar" (0.24). Adjectives such as "attractive", "individualistic", and "meaningful" were relatively influential compared with other adjectives. The regression coefficients for the "willingness to visit" model were "revisit desirable" (0.86) and "walking desirable" (0.66).

5. Conclusions

This study aimed to investigate the internal structure of SOP based on existing definitions of SOP and formation theories postulating that SOP is related to interactions between human and environmental elements. Moreover, the summarized findings below follow careful review of the history and characteristics embedded in Daehak-ro, combined with the internal structure of SOP derived from this study.

First, the physical, sociocultural, and experiential factors of Daehak-ro were correlated with each other, and each of these factors was found to have a significant effect on the SOP formation of Daehak-ro. In addition, a significant correlation was found in the relationship between Daehak-ro's SOP and the "willingness to visit" model. In essence, if people's satisfaction with the physical, sociocultural, and experiential factors of Daehak-ro was high, their perceptions of the location's SOP also improved. Furthermore, the greater the SOP perceptions, the higher the willingness to visit became.

Regarding the SOP formation for Daehak-ro, this study's results show that the sociocultural factor was the most influential, followed by the experiential and the physical factors. This suggests that the sociocultural factor, which is closely associated with a number of performance-related organizations (e.g., small theater and performing venues) and cultural art organizations (e.g., galleries and museums) at Daehak-ro, has the biggest impact on its SOP formation. Furthermore, it can be safely assumed that the experiential (e.g., diverse theater and street performances) and physical factors (e.g., building form) play an im-

portant role in the SOP formation for Daehak-ro. Notably, the finding that the experiential factor is more influential than the physical factor could be attributed to the fact that the street performances have been transformed into cultural arts within the specific place created.

In the SOP formation for Daehak-ro, the physical factor was evaluated as having the lowest impact. This clearly indicates the negative impact of disorganized development plans to destroy a number of traditional buildings (e.g., red brick buildings) tied to the identity of Daehak-ro. The sociocultural factor was closely correlated with the physical factor. In this respect, if appropriate forms and materials for the buildings reflecting the identity of Daehak-ro are proposed in the future, following a full review of the sociocultural factor, the physical factor may be one of the most important elements in the SOP formation for Daehak-ro. In the meantime, regarding the factors representing the SOP formation for Daehak-ro, adjectives such as attractive, characteristic, and meaningful were highly rated compared to other adjectives. These results may be linked to the SOP characteristics formed by the inherent art cultures embedded in Daehak-ro.

Second, Daehak-ro, which is characterized by a "conscious SOP",[5] is an artificial place created by environmental planners and designers in an existing residential area with commercial shops and a university. Such features were completely reflected in the physical, sociocultural, and experiential elements of Daehak-ro; through intensive efforts to make Daehak-ro a center of cultural performance and arts, the tradition of Daehak-ro may be maintained and inherited as a valuable space for youth culture.

Daehak-ro is also recognized as a place full of nostalgia, as old alleyways, buildings, and street vendors abound. Coupled with an inherent tradition, modern culture coexists in Daehak-ro in the form of a number of small cafes, restaurants, and fashion-related prop shops that infuse Daehak-ro with vitality. In the circumstances of "creative destruction"[6] being propelled by the capitalization of urban space − associated with unified designs and socio-economic changes − the prevalent culture of modern consumption and the commercialized cultural arts and performances that degenerate the youth culture of Daehak-ro will prompt the cultural art organizations to leave the cultural district. Fortunately, the inherent characteristics of Daehak-ro remain unchanged thanks to the SOP imbued by environmental planners and designers.

Daehak-ro was evaluated as a meaningful and important place in terms of its SOP, as it preserves its inherent cultural character. Drastic changes are in contemplation and have resulted in the cultural art space in Daehak-ro being gradually degraded by misinterpretation of the space as a main commercial area, due to a modern culture of consumption.

The significance of this study lies in its design, which derives the internal SOP structure to quantitatively determine the impacts of environmental factors, with the intention of applying the practical results to environmental planning and design. This study also has the following limitations: (1) the measurement of satisfaction was based only on the components of the street environment, and (2) a wider application of the generalized internal SOP structure derived from this study. However, if additional studies are conducted that sufficiently consider a diverse SOP index and the factors derived from this study, the results of this research may provide useful raw data for environmental planners and designers to formulate sustainable place development based on the SOP.

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5) A conscious sense of a place conveys "a place is beyond the survival level of animals, and it can deliver joy, surprise, wonder, and fear. The ability to listen to such communication with an insight makes a human life rich." Here, the phrase "the ability to listen with insight" is a clear judgment behavior: it implies that one's own expectation is compared with a new experience (Relph, 1976).

6) "Creative destruction" is a term commonly used to describe the process of destroying an existing landscape in the process of redevelopment for the generation of capital (Choi, 2012). Destroying an existing urban landscape is necessary for the creation of a new landscape (Choi, 2012).

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