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# Formation of Sense of Place Trough Urban Design Project in Chiba, Japan: *Relationships between Change of Emotional Values and Experiential Recognition of Place*

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**Abstract:** Many cities worldwide adopted varied approaches to build their urban image based on social, historical, cultural, and natural factors and continue their efforts to revitalize. In many Japanese cities, there are various ways to utilize public spaces for urban regeneration. However, studies that prove the effectiveness of this approach are few. Since 2000, Chiba's "Parasol Gallery" has witnessed urban design activity that recreates public streets into outdoor galleries through exhibition by amateur citizen artists. This study classifies the emotional factors experienced by subjects under different conditions, with the changes in physical environment. It analyzes the relationship between change in emotional factors and experiential recognition of place. The method of study is divided into "days of Parasol Gallery" and "days without it," and three groups were surveyed: Parasol Gallery's artists, Parasol Gallery's visitors, and general citizens. The changes in sense of place of these three groups was verified by factor analysis and regression analysis in terms of five elements: place attachment, the meaning of place, behavior intention, place cognition, and experiential value.

## 1. INTRODUCTION

Urban design is an essential factor in maintaining the competitiveness of modern cities. Many cities worldwide adopted varied approaches to build their urban image based on social, historical, cultural, and natural factors. Efforts to revitalize cities, places, and special street projects continue. These approaches, in turn, catalyze places that have social value in human perception. In general, the concept of "place" in the humanities and social sciences goes beyond the dictionary definition of "a particular portion of space, whether of definite or indefinite extent." Particularly, the academic discourse around the concept of places has been transformed over the last few decades under the influence of modernity and globalization (Arefi, 1999). In other words, it was the scholar's problem of consciousness of



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“place” that this concept was understood beyond the perception of physical or geographic “location” to encompass the element of human practice.

Geographers ([Relph, 1976](#)) argued that the different characteristics of a place provided people with a sense of inner feeling and helped establish a deep connection with it. A study of the relationship between sense of place and human consciousness entailed an analysis of emotional factors that could influence the formation of a sense of place and the physical environment. It found that the value of the place was composed of five elements: place attachment, place meaning, behavior intention, place cognition, and experiential value. These elements have been applied in various approaches to measure the value of a place ([Bonnes, Bonaiuto et al., 2003](#); [Ghorbanzade, Mehrani et al., 2019](#); [Hashemnezhad, Heidari et al., 2013](#); [Jeong, Y., Kim et al., 2019](#)). The present study explores the effect of existence and non-existence of a place on the formation of value and the emotional effect through the implementation of urban design projects that citizens can experience in urban spaces.

K. Lynch, in his book called *Site Planning* published in 1984, argues that many cities are creating scarce elements in urban growth rather than having factors affecting human activity since the beginning of the city's formation ([Lynch, 1984](#)). As such, if human activity is the basic element of urban place, I should discuss the relationship between place and human behavior. With the opening of the Tokyo Olympics in 2020, many cities and local governments in Japan have been actively working to build a city image or urban design through various human-centered regional events, festivals, and cultural development activities. It is necessary to study how the elements that create a sense of place so far affect the sensitivity of citizens as the characteristics of the place change. The present study has a theoretical motive in its approach to the “sense of place” of [Canter \(1977\)](#) and [Panter \(1991\)](#). With this theoretical background, this study focuses on five representative elements that are considered significant in creating a sense of place.

[Canter \(1977\)](#) argued that the constituent elements of a place are largely divided into the format, image, and activities conducted in it. On the other hand, [Panter \(1991\)](#) focused on the theoretical model of Canter and reconstructed the sensory aspects of the place. Panter argued that the sense of place conditions are derived from the meaning of the place, form, and behavioral pattern experienced within the place. [Lukermann \(1964\)](#) proposed that places are entities that are historically relevant to spatial interaction, to the movement of the population, and to the extent that is relevant. [Entrikin \(1991\)](#) said that place also has a context of behavioral domain that connects events and objects, [Stedman, Richard C \(2002\)](#) claimed that space revealed by a context has some influence on human psychology, and this notion can provide a socio-psychological model of interaction between humans and their environment. [Tuan \(1980\)](#) said this notion model embodies the environment and social relationships necessary to activate the place. Additionally, [Hummon \(1992\)](#) and [Kruger \(1996\)](#) showed that the relationship between place activation and its effects can present a verifiable hypothesis as a recognizable conceptual element of the location. This means that the notion of a place should be addressed in the overall context. In other words, the value of a place obtained through an artificial change can represent the social psychological influence due to the aforementioned “physical function as a place” and human's “emotional value or cognitive aspects”.

Before discussing the research differentiation, the researchers note that they simulated physical environment changes using the Parasol Gallery, urban design projects at Central Park Promenade, downtown main street, Chiba, Japan. This study uses the most popular keyword of sense of place in public spaces as the background. There are differences from several previous studies in that they studied the five things of place sensitivity that appear in the frame. A study by [Kaida \(2015\)](#) discussed the psychological process of individual sensory differences and formation of place identity in place attachment. A study by [Karasda \(1997\)](#) discussed the boundary or neighborhood environment of the region defining the image of the place. In a study by [Lentini and Decortis \(2010\)](#), the physical environment was constructed, and human cognition in the empirical elements affecting it was classified into five dimensions. Each study is meaningful in that they intensively researched one keyword. However, there is a lack of discussion on the interaction of each detailed keyword in the within the sense of place. Therefore, this study identifies the degree to which road changes affect human experiences and perceptions, focusing on the locational elements. This study differs from previous studies on the sense of place in three main aspects. First, the fragmentary emotional measures adopted by previous studies on sense of place are more diversified. To this end, we selected all five elements of the formation of sense of place mentioned as important in previous studies. Second, it estimated the place on a usual day and that it would be different from the parasol event day. It then considered how the event's hosting and closing would represent the examined emotional elements. Third, we looked at emotional factors we felt invoked by the place that affected our satisfaction. The differentiation of this study is meant to explain the effect of sense of place on urban design projects in Japan.

## **2. LITERATURE REVIEW**

### **2.1 Studies on the place in the sense of place**

Various studies in the urban and architectural fields related to sense of place or place identity have conducted active research focusing on the physical environment of a place and individual characteristics of humans. On the other hand, advanced research has been relatively passive about the various effects of artificial environmental changes on human emotions caused by cultural events or the revitalization of places. In Western studies, the focus was mainly on the theory of sense of place and the related content was to be discussed ([Giuliani, Maria Vittoria, 2003](#); [Kyle, Mowen et al., 2004](#)). In the East Asian studies in the 2000s, various elements of the theory of sense of place were identified through individual factual evidence ([Jeong, Y., Kim et al., 2019](#); [Okano, Kurata et al., 2019](#)). If previous research began with the assumption that the physical environment is an influential factor as a static system, we now believe that we need to focus on environmental changes and the effects of emotional factors as dynamic systems. For this reason, five elements of sense of place in this study were defined based on previous research. The used adjectives for measurement of sense of place were derived from the measurement methods that have been used primarily to assess the sensory value of place. This study explores the sense of place using various adjectives ([Giuliani, M Vittoria and Feldman, 1993](#); [Proshansky, Fabian et al., 1983](#); [Williams and Roggenbuck, 1989](#))

was on the meaning of place. The related studies emphasized the importance of the emotional aspect felt by the people about a place and discussed the relationship between the place attachment and the purpose and meaning of life in the living space.

Place attachment can be divided into place identity and place dependence. Place identity is a symbolic meaning for a place, which can be interpreted as the notion that emerges out of the purposes it is used for ([Im, S., Kwon et al., 2012](#)) argued that place identity is generally determined by location and has more influence through the diversity of everyday activities. Place dependence can be regarded mainly as a functional means and is a combination of people and places based on certain conditions in a place ([Choi and Yim, 2005](#)). [Sarah \(2013\)](#) proved that the element of experience is the most influential factor in place attachment. Therefore, place attachment in this study defined as the change of consciousness by human-place interaction and the intangible value of the place. The meaning of place is sometimes the feelings that humans feel in that place ([Williams, Patterson et al., 1992](#)). It can be distinguished. [Stedman, R.C. \(2008\)](#) identified the relationship between place-attachment when emotion and the meaning of place are used as explanatory elements to describe a place. Additionally, the meaning of the place that affects the behavior of users affects the building of an image by experience, and structural aspects of culturality and sustainability need to be considered. Thus, in this study, the meaning of a place can be defined as an emotional component that is intended when experiencing the place.

## 2.2 Status in The Behavior intention and Place cognition

Behavior intention in previous studies is based on the evaluation of group experiences. As a result of analysis, the individual behavioral factors are discussed as revisit and oral tradition. [Fridgen \(1984\)](#) and [Hwang \(2014\)](#) argued that it is also possible to divide behavior into direct and indirect intentions. According to the definition of Fridgen, “direct intention” implies a revisit where one is satisfied, and “indirect intention” refers to the behavior one would like to recommend to others without visiting. Therefore, the term “behavior intention” in this study defined as the intention of action can be different according to the value of the place and defined as the concept of change according to the purpose.

Place cognition is related to the historicity, symbolism, place, commercial, and cultural elements of a place ([Kim and Choi, 2011](#)). [Im, H. N., Kang et al. \(2013\)](#) argued that place cognition is formed by individual emotions. Thus “individual emotions”, “personal activities” and “experience” should be considered to improve the sense of place. Further, [Shin and Choi \(2010\)](#) suggested that place cognitive factors could differ depending on user characteristics and these differences could be read as ‘sense of place factors’. This study defines ‘sense of place’ in terms of the way the changes in a place due to reconstitution or street vitalization by intentional human actions affects perceptions. In addition, defines place perception as the “placeness” formed by changes in the physical environment, such as various events, festivals, and cultural activities that are not fixed but are changed intentionally.

### 3. RANGE AND METHOD

#### 3.1 Range of Study

The geographical scope of this research was limited to Central Park Promenade and Central Park in Chiba, Japan. This area is Chiba's main street and mainly comprises banks, academies for elementary and junior high school students, and post offices. This area is mainly used for commuting on weekdays, but there is a change to a lively place with various local festivals on weekends. Researcher Kwak has been hosting the Parasol Gallery since 2000 to simulate street regeneration and the formation of a sense of place. Particularly, the Parasol Gallery is an urban design project that recreates public streets into outdoor galleries through the exhibition of works by amateur citizen artists.

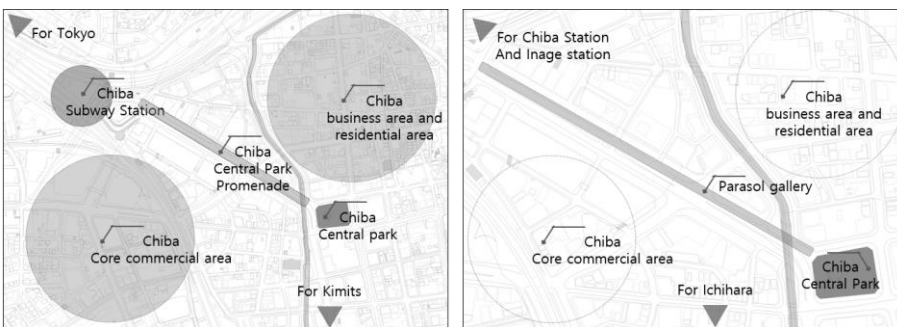


Figure 1. Location of Central Park Promenade and Central Park in Chiba

The scope of this study was divided into two parts. First, a survey on “Parasol Gallery’s artists” and “Parasol Gallery’s visitors” was conducted on October 6-7, 2018, when the Parasol Gallery event was held. The other survey was conducted on the “general citizens” from 11:00 to 15:00 on weekdays, i.e., October 8-12, 2018.



Figure 2. Weekday (left) and Parasol Gallery (right) on the Central Park Promenade



Figure 3. Weekday (left) and Parasol Gallery (right) in the Central Park

## 3.2 Process and Method

The research methods of this study include survey and statistical verification. First, the survey was divided into three groups: Parasol Gallery's artists, Parasol Gallery's visitors, and general citizens. Study data for the survey main category is divided into personal characteristics, place use property, adjective index, and measuring of sense of place. In particular, the survey included the five elements of the sense of place, namely place attachment, place meaning, behavior intention, place cognition, and experiential value, and the new place element "adjectives of a sense of place" were added. The reason is that it is judged that the sensory value felt in the place can be quantified through adjective terminology. These methods enabled respondents to demonstrate their emotional value regarding "place" when a Parasol Gallery event is held in a place and when it is not held in that same place.

The study process was largely divided into three steps. Step 1 was basic statistics, step 2 was factor analysis, step 3 was regression analysis. The analysis index was presented in terms of these elements; place attachment, the meaning of place, behavior intention, place cognition, experiential value. The analysis index implies the excluding adjective analysis, which applied to all three survey groups. "Adjectives of sense of place," "place meaning," and "place cognition" were factors for analyzing emotional factors between the study site and each group. "Place attachment," "behavior intention," and "empirical value" were factors for extracting the influence factors of each group from the study site. In statistical verification, three groups were compared and analyzed through factor analysis model and regression analysis model. *Factor analysis* is a statistical technique for identifying the structure shared between measurements that take into account the correlation between questions and variables or the objects being measured. Through this, we tried to analyze the factors that affect the emotional changes in the three groups according to the environment created in the place. *Regression analysis* is a statistical technique that describes a statistical causal relationship between one or more predictors and response variables. We conducted a regression analysis to identify the emotional factors that affect the satisfaction of the three groups according to the environment created.

## 4. RESULTS AND INTERPRETATION

### 4.1 Basic Statistical Analysis of Each Group

*Table 1* shows the results of the basic statistical analysis for the characterization of the survey data. Survey data were divided into three groups: "Parasol Gallery's visitors (Group\_A)," "Parasol Gallery's artists (Group\_B)," and "general citizens on a weekday (Group\_C)" and analyzed for frequency and percentage. The term "satisfaction" was analyzed by adding average.

In the case of "companion," "friends" was high in Groups A and B. On the other hand, in Group\_C, "alone" showed the highest response rate. This result can attribute to the fact that the ratio of students among the respondents was the highest. This location has academies for elementary and junior high school students and local shopping streets where they spend shopping or leisure time twice a week after school on weekdays.

Looking at the frequency of visits, Groups A and B had a “once a month” high response rate. On the other hand, Group\_C had the highest response rate for “over three times weekly.” The reason can interpret as a result similar to the one estimated by “accompany.” Regarding “purpose of visit,” “shopping” in all groups had the highest response rate. The next highest response rate in Groups A and B was for “enjoy local festival” and in Group\_C was for “promise and meeting.”

Table 1. Basic statistical analysis of personal characteristics and place use property in Parasol Gallery’s

Group Name	Elements	Visitors (Group_A)	Artists (Group_B)	General citizens on a weekday (Group_C)
Gender (%)	Male	30.26	31.60	57.97
	Female	69.74	68.40	42.03
Age (%)	15-20 years old	3.95	1.80	20.29
	21-30 years old	21.05	8.80	63.77
	31-40 years old	13.16	10.50	5.80
	41-50 years old	14.47	19.30	4.35
	51-60 years old	17.11	22.80	1.45
	over 60 years old	30.26	36.80	4.35
	Employee	14.67	15.80	4.35
Job (%)	Self-employee	6.67	8.80	1.45
	Specialized Job	1.33	1.80	0.00
	Student	21.33	8.80	79.71
	Housewife	29.33	35.10	7.25
	Inoccupation	13.33	15.80	2.90
Companion (%)	Etc.	13.33	14.00	4.35
	Alone	19.74	17.50	49.28
	Accompanied couple	11.84	14.00	1.45
	Family	31.58	29.80	18.84
Frequency of Visit (%)	Friends	31.58	31.60	30.43
	Etc.	5.26	7.00	0.00
	Every day	6.58	7.00	7.25
	One or two times weekly	6.58	7.00	26.09
	Over three times weekly	0.00	0.00	34.78
Purpose of Visit (%)	One or two times monthly	26.32	21.10	1.45
	Less than once a month	55.26	57.90	23.19
	For the first time	5.26	7.00	7.25
	Shopping	34.00	0.27	37.60
	Commuting	5.20	0.08	4.70
	Relaxation	1.00	0.01	3.50
	Use transportation services	8.20	0.10	7.10
	Use cultural facilities	10.30	0.13	5.90
	Use bank and Post	9.30	0.11	2.40
	Use café and restaurant	10.30	0.10	12.90
Satisfaction of Location (%)	Enjoy local festival	13.40	0.13	7.10
	Promise and meeting	1.00	0.01	14.10
	Etc.	7.20	0.06	4.70
	Very unsatisfactory	10.53	12.30	5.88
	unsatisfactory	6.58	7.00	7.35
Satisfaction of Location (%)	Normal	32.89	21.10	50.00
	Satisfactory	27.63	29.80	29.41
	Very satisfactory	22.37	29.80	7.35

Group Name	Visitors (Group_A)	Artists (Group_B)	General citizens on a weekday (Group_C)
Average of Satisfaction of Location (average)	3.447	3.579	3.250

These results can be interpreted in the light of the commercial nature of the environment around the Central Park Promenade and Central Park. On the day the Parasol Gallery event was held, it was also possible to confirm that the “purpose of visit” to the place had changed. Hence, Groups A and B could meet their desire for outdoor activities like festivals, cultural facilities, and shopping needs. “Satisfaction of location” showed the highest response rates in Groups A and C, and the rates of “satisfactory” and “very satisfactory” were the highest in Group\_B. That average was Group\_A=3.447, Group\_B=3.579, and Group\_C=3.250. These results coincide with previous studies, such as the one by [Hong \(2013\)](#) that show that urban design projects increase the satisfaction of those involved in the project more than the general citizens on a weekday. It is also similar to the study by [Kang, Song et al. \(2017\)](#) where the satisfaction level of the group of who had the information about the project was higher than the general citizens participating in the urban regeneration project. However, it is contrary to the results of the study by [Jeong, U. C. \(2010\)](#). Therefore, the satisfaction of the group of stakeholders and general visitors who are familiar with the event project does not always yield the same result. In this study, the officials were interpreted as having higher satisfaction with more information about the event because they were simultaneously related artists and visitors or buyers.

Overall, the fact that the average satisfaction level for Group\_A did not differ significantly from that of Group\_B suggests that the environmental changes in the event place may not have been dramatic. However, a higher level of satisfaction than that for Group\_C suggests that for vitalization, the culture and local event may have some effect on the satisfaction level. Further, considering the frequency of visits by Groups A and B, participation in the Parasol Gallery event is likely to be a one-time thing. Therefore, it can be assumed that even if any event occurs in the same place, it would not have a special meaning for satisfaction in terms of basic statistics when it differs from the purpose of the first visit.

## 4.2 Basic statistics used Adjective Index

Studying the image analysis of cities through adjective index is a research method for evaluating the sense of place, and it has been mainly conducted through a cognitive approach ([Hagerhall, 2000](#); [Herzog, 1992](#)). Especially, the study by [Joo \(2003\)](#) explained the overall atmosphere and image of the urban through landscape adjectives. It was intended to verify the meaning given to a place through the experience of events occurring in the street within the living space. Therefore, an adjective index analysis was performed as a method of identifying cognitive characteristics.

*Table 2* shows the evaluation results of sense of place by the adjective index. Groups A and B showed similar evaluation results for all elements. An average rating of 3.0 or above can be considered as a positive evaluation. In Groups A and B, 15 out of 21 indexes of adjectives were above 3.0. Among the 15 indexes, the element with the standard deviation that exceeded 1.0 were “dishevelled or beautiful,” “unvalued or valued,”

“unclean or clean,” or “dark or bright,” “narrow or broad,” “heavy or laid back.” In Group\_C, elements of above-average 3.0 and above standard deviation 1.0 was observed for “uncharacteristic or characteristic,” “old-fashioned or new,” “narrow or broad,” “chilly or friendly,” “gloomy or refreshing,” “unusual or usual,” “unvalued or valued,” “unclean or clean,” “dark or bright,” and “bad in quality or good in quality.” That is, Groups A and B tended to be more positive than Group\_C. Groups A and B influenced emotional evaluation changes because the purpose of visit was more conclusive than in case of Group\_C.

Table 2. Basic statistical analysis of adjective of sense of place

Element of negative	Visitors (Group_A)		Artists (Group_B)		Citizens on a weekday (Group_C)		Element of positive
	Average	S.D	Average	S.D	Average	S.D	
In disorder	3.066	0.899	3.088	0.95	2.768	1.045	Quiet
Uncharacteristic	2.934	1.087	2.825	1.088	3.000	1.150	Characteristic
Greyly	3.329	0.999	3.316	0.985	2.754	1.205	Street with trees
Bad in quality	3.079	0.906	3.123	0.847	3.203	1.106	Good in quality
Discontinuous	3.158	0.865	3.158	0.882	2.986	0.962	In succession
Dishevelled	3.053	1.044	3.105	1.064	2.928	0.990	Beautiful
Old-fashioned	2.974	0.832	3.000	0.845	3.000	1.029	New
Narrow	3.342	1.114	3.298	1.117	3.014	1.194	Broad
Heavy	3.145	1.08	3.211	1.098	2.841	1.093	Laid back
Chilly	3.092	0.926	3.123	0.847	3.058	1.042	Friendly
Offensive	3.171	0.971	3.14	0.972	3.13	0.984	Pleasant
Gloomy	3.066	1.037	3.053	0.99	3.058	1.110	Refreshing
Monotonous	3.026	0.993	3.140	0.99	2.942	1.187	Complex
Unusual	3.276	0.903	3.281	0.861	3.014	1.036	Usual
Unvalued	3.171	1.012	3.175	1.02	3.174	1.111	Valued
Unclean	3.250	1.034	3.246	1.005	3.203	1.195	Clean
Dark	3.184	1.055	3.228	1.086	3.159	1.009	Bright

Table 3 shows the evaluation results of place meaning by the adjective index. The elements of above-average 3.0 and above standard deviation 1.0 in three groups common included “be meaningless or be meaningful.”

Table 3. Basic statistical analysis of the meaning of place

Element of negative	Visitors (Group_A)		Artists (Group_B)		Citizens on a weekday (Group_C)		Element of positive
	Average	S.D	Average	S.D	Average	S.D	
Meaningless	3.224	1.078	3.263	1.027	3.029	1.071	Meaningful
Distracted	2.868	0.854	2.877	0.888	3.13	1.042	Orderly
Not strong	2.711	0.991	2.789	1.081	2.812	1.004	Intense
Not free	3.171	0.806	3.105	0.859	3.304	0.828	Free
Indistinguishable	2.934	0.854	2.877	0.908	3.029	0.874	Distinguished

Element of negative	Visitors (Group_A)		Artists (Group_B)		Citizens on a weekday (Group_C)		Element of positive
	Average	S.D	Average	S.D	Average	S.D	
Have no character	2.776	1.028	2.772	1.053	2.783	1.041	Distinctive
Unattractive	2.908	0.912	2.860	0.915	2.899	1.045	Attractive
Not individuality	2.737	0.971	2.737	1.009	2.667	1.080	Unique
Not special	2.816	1.016	2.825	1.027	2.725	1.027	Special
Not genial	3.158	0.784	3.035	0.801	3.058	0.998	Generalize
Not friendly	2.934	0.984	2.965	1.034	2.942	0.922	Feel friendly
Not convenient	3.171	1.025	3.035	1.085	3.246	0.914	Convenient

These results can be interpreted as the meaning of the place itself rather than the effect of outdoor activities, such as the culture and local event. In Groups A and B, the above-average elements (3.0) and ones with standard deviation more than 1.0 were in terms of being meaningless or meaningful and being inconvenient or convenient.” On the other hand, for Group\_C, it was “be meaningless or be meaningful” and “be distracted or be orderly.” Table 4 shows the evaluation results of place cognition. The three groups yielded different results. Groups A and B found that all elements scored an above-average of 3.0. However, “symbolic” in Group\_A had a standard deviation of 1.0 or less. In the case of Group\_C, the average above 3.0 was for “commercial” and “cultural character.” This means that the physical environment changes, such as those in the Parasol Gallery event, can change place cognition. That is to say, the place meaning was artificially changed due to the formation of the “culture and local event” could be recognized differently by individuals. This means that the meaning of place in environmental change activities, such as the culture and the local events, are recognized differently depending on personal characteristics.

Table 4. Basic statistical analysis of place cognition

Element of negative	Visitors (Group_A)		Artists (Group_B)		Citizens on a weekday (Group_C)	
	Average	S.D	Average	S.D	Average	S.D
Symbolic	3.329	0.971	3.333	1.006	2.739	1.12
Commercial	3.118	1.032	3.158	1.049	3.478	0.949
Cultural character	3.434	1.1	3.404	1.083	3.072	1.089
Creativity	3.303	1.143	3.263	1.188	2.696	1.019
Impressive	3.329	1.076	3.351	1.126	2.71	0.987

### 4.3 Measuring the Sense of Place Using Factor Analysis

According to Wikipedia, factor analysis is “a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors,” and “the

theory behind factor analytic methods is that the information gained about the interdependencies between observed variables can be used later to reduce the set of variables in a dataset.” This study found potential independent variables in “experiential value,” “behavior intention,” and “place attachment” through factor analysis. The software used for factor analysis was SPSS ver.22.0.

Table 5 shows the factor analysis results for Group\_A. Four groups were extracted, and 26 of the first 35 variables were formed into factors. Each factor appeared in the following order: “experiential value,” “place attachment,” “behavior intention,” and “loss of time perception.” Most interesting is the formation of a new group of factors that were not considered in the initial analysis model- “factor of loss of time exception.” The measurement variables that formed the group of factors consisted of time-related variables.

Table 5. Factor Analysis of Parasol Gallery’s Visitors (Group\_A)

Sense of place on the measurement element	Resulting Group Factor				Cronbach’s Alpha
	Experiential value	Place attachment	Behavior intention	Loss of time perception	
Experience in this place is valuable.	0.833				
Overall, the experience in this place is satisfactory.	0.829				
The experience at this place was consistent with the purpose of the visit.	0.817				
The experience at this place gave me joy and novelty.	0.806				
The experience in this place is very interesting.	0.795				0.935
Experience in this place is more exciting than anywhere else.	0.795				
The street facilities here are connected by visual production.	0.698				
Experience in this place leads to an improvement in the quality of life.	0.658				
This place is important to me compared to other places.		0.84			
This place means something to you.		0.827			
Feel a sense of belonging to this place.		0.787			
This place is the only place for me.		0.781			0.923
This is the place where your emotions can be expressed.		0.743			
I want to spend more time in this place.		0.731			
Feel special in this place.		0.726			
I’d like to visit this place again.		0.67			

This place is more satisfactory than other places. 0.526

Sense of place on the measurement element	Resulting Group Factor			Loss of time perception	Cronbach's Alpha
	Experiential value	Place attachment	Behavior intention		
I am willing to keep track of this area.			0.833		
I would like to urge my acquaintances to visit this place.			0.793		
I want to experience this place more.			0.781		0.887
I'd like to invest my time in finding information here.			0.764		
I'm willing to visit this place again.			0.693		
I liked this place that I didn't even notice the passing of time.				0.824	
I had no other memories while I was experiencing this place.				0.790	
Experience in this place has allowed us to escape from our daily lives.				0.729	0.841
The experience here made me lose track of time.				0.676	
Eigenvalue	10.419	4.056	2.223	1.682	-
KMO	0.831				
Bartlett's test of Sphericity				Chi-Square = 1574.203	
				df(p) = 351(.000)	
Factor extraction method: Principal component analysis. Rotating method: vary-max with Kaiser normalization(6).					

The results can be inferred by ordinary citizens who used the place at the time of the cultural and local event and could not keep track of time during the event. This suggests that the results of the local event can provide some psychological satisfaction and “social emotion enhancement” to citizens as well as to the partaker. A review from the preceding study confirmed that the same factors were bound to the various locality-related elements that were collected. This means that the factors of many places that have been mentioned have some empirical effect.

Table 6 shows the factor analysis results for Group\_B. The extracted factors represent the same factors and rankings as the factors of Group\_A. This can be inferred from the intuitive judgment that the cultural and local event affected both the citizens and the partaker. This is similar to the way in which the factor of sense of place, which was mentioned in prior studies, has an emotional impact as a typical result for the parties and citizens. However, only 25 of the 35 variables initially performed were formed into groups of factors. These results indicate that the initial purpose of visiting a place was clearer for Group\_B compared to Group\_A.

Table 6. Factor Analysis of Parasol Gallery's Artists (Group\_B)

Sense of place on the measurement element	Resulting Group Factor (coef)				Cronbach's Alpha
	Experiential value	Place attachment	Behavior intention	Loss of time perception	
The experience in this place is very interesting.	0.847				
Experience in this place is valuable.	0.839				
The experience at this place gave me joy and novelty.	0.797				
The experience at this place was consistent with the purpose of the visit.	0.797				
Overall, the experience in this place is satisfactory.	0.772				0.954
Experience in this place is more exciting than anywhere else.	0.771				
Experience in this place leads to an improvement in the quality of life.	0.737				
This place is capable of creating a vibrant environment.	0.723				
This place means something to you.		0.853			
This place is important to me compared to other places.		0.831			
This place is the only place for me.		0.792			
Feel a sense of belonging to this place.		0.783			0.925
This is the place where your emotions can be exercised.		0.766			
Feel special in this place.		0.733			
This place is more satisfactory than other places.		0.484			
I am willing to keep track of this area.			0.818		
I'd like to invest my time in finding information here.			0.798		
I would like to urge my acquaintances to visit this place.			0.798		0.912
I'm willing to visit this place again.			0.749		
I want to experience this place.			0.737		
I want to experience this place more.			0.504		
I didn't feel the time passing through this place.				0.856	

I had no other memories while I was experiencing this place. 0.825

Sense of place on the measurement element	Resulting Group Factor (coef)				Cronbach's Alpha
	Experiential value	Place attachment	Behavior intention	Loss of time perception	
Experience in this place has allowed us to escape from our daily lives.				0.784	0.909
The experience here made it impossible to feel the passing time.				0.730	
Eigenvalue	12.566	3.146	1.792	1.557	
KMO	0.8				
Bartlett's test of Sphericity	Chi-Square = 1454.379 df(p) = 300(.000)				
Factor extraction method: Principal component analysis. Rotating method: vary-max with Kaiser normalization (6).					

Table 7 shows the factor analysis results for Group\_C and differs from Groups A and B. “Factor of loss of time exception” that was common in Groups A and B disappeared, and “factor of behavior input” divided the results into two factors. These results were considered to be similar [Fridgen \(1984\)](#) but differed in terms of direct and indirect actions.

Table 7. Factor Analysis of Citizens on a Weekday (Group\_C)

Sense of place on the measurement element	Resulting Group Factor				Cronbach's Alpha
	Place attachment	Experiential value	Behavior intention (indirect)	Behavior intention (direct)	
This place is important to me compared to other places.	0.84				0.923
Feel a sense of belonging to this place.	0.832				
This place means something to you.	0.797				
Feel special in this place.	0.784				
I feel special in this place.	0.728				
This place is always bothering me.	0.689				
This place is the only place for me.	0.685				
I want to spend more time in this place.	0.617				
I didn't feel the time passing through this place.		0.788			
I had no other memories while I was experiencing this place.		0.744			0.92
Experience in this place has allowed us		0.737			

to escape from our daily lives.

Sense of place on the measurement element	Resulting Group Factor				Cronbach's Alpha
	Place attachment	Experiential value	Behavior intention (indirect)	Behavior intention (direct)	
Experience in this place leads to an improvement in the quality of life.		0.565			
This place is capable of creating a vibrant environment.		0.521			
I want to experience this place more.			0.772		
I am willing to keep track of this area.			0.707		0.834
I am willing to recommend a visit to this place to an acquaintance.			0.537		
I want to visit this place often.				0.797	
I'm willing to visit this place again.				0.751	0.799
This place is more satisfactory than other places.				0.445	
Eigenvalue	8.83	2.431	1.285	1.065	
KMO	0.858				
Bartlett's test of Sphericity	Chi-Square = 876.114 df(p) = 231(.000)				
Factor extraction method: Principal component analysis. Rotating method: vary-max with Kaiser normalization(7).					

It also appeared only in Group\_C, unlike Group\_A and Group\_B. Group\_C only showed that the use of place is unclear compared to Groups A and B where the purpose of use and participation is relatively clear. These were similar to (Koeck and Roberts, 2010).

The priority of the factor was also different from the highest correlation coefficient. Factors derived from Groups A and B were common in the order of “experiential value,” “place attachment,” “behavior intention,” “loss of time exception.” However, the factors found in Group\_C were “place attachment,” “experiential value,” “behavior intention (indirect),” and “behavior intention (direct).” These results show that the nature of the place has changed due to the hosting of Parasol Gallery. Generally, citizens who participate in outdoor activities, such as cultural and local events are divide into visitors and partakers or exhibitors. The common factor of Groups A and B is that they have been directly or indirectly involved in Parasol Gallery. Therefore, it is clear that the experiential value in terms of the physical environment change is an important factor. In Group\_C, place attachment will be more important than experiential value because they are people who visit the place for shopping and leisure purposes when outdoor activities do not take place. The results of the factor analysis confirmed that different groups show different rankings of factors for their locality under different conditions in the same place. The results indicate that the formation of cultural and local events directly affects the emotional factors that citizens feel.

#### 4.4 The Satisfaction and Measurement of the Sense of Place

Regression analysis was performed to assess the level of satisfaction of each group by the individual elements of the place sensory element. Tables 8-10 show the results of the regression analysis. For all three groups, there were relatively few variables that significantly affected satisfaction. These results are due to the analysis of human emotions in places, unlike previous studies based on the physical environment.

Table 8. Regression Analysis of Group\_A

Sense of place on the measurement element		Parasol Gallery's visitors				
Dependent variable: satisfaction_location		B	SE	$\beta$	t	p
1   Constant		3.993	1.06	-	3.765	0
I am willing to keep track of this area.	Q_d3	-0.327	0.353	-0.248	-0.926	0.359
I want to experience this place.	Q_d5	-0.199	0.358	-0.147	-0.555	0.582
I'm willing to visit this place again.	Q_d6	0.066	0.28	0.051	0.237	0.814
I am willing to recommend a visit to this place to an acquaintance.	Q_d8	-	-	-	-	-
This place means something to you.	Q_e8	0.004	0.342	0.004	0.013	0.99
Feel a sense of belonging to this place	Q_e9	0.637	0.364	0.487	1.75	0.087
I want to spend more time in this place.	Q_e10	-0.279	0.309	-0.23	-0.905	0.37
I'd like to visit this place again.	Q_e11	0.606	0.286	0.524	2.122	0.039
Experience in this place is valuable.	Q_f2	-0.447	0.346	-0.352	-1.292	0.203
Experience in this place is more exciting than anywhere else.	Q_f4	-0.429	0.274	-0.337	-1.569	0.124
This place is capable of creating a vibrant environment.	Q_f6	-	-	-	-	-
Frequency_Purpose		-0.196	0.118	-0.243	-1.664	0.103
Discussed model		R <sup>2</sup> =0.435   Adju-R <sup>2</sup> =0.279 F=1.222   P=0.067				

In Table 8, only Q\_e9 and Q\_e11 variables showed a significant effect on satisfaction when the Parasol Gallery event was held. After all, the higher the sense of belonging, the higher the re-visitation rate.

Table 9. Regression Analysis of Group\_B

Sense of place on the measurement element		Parasol Gallery's artists				
Dependent variable: satisfaction_location		B	SE	$\beta$	t	p
1   Constant		3.628	1.271	-	2.855	0.008
I am willing to keep track of this area.	Q_d3	1.663	0.776	1.071	2.142	0.041
I want to experience this place.	Q_d5	0.942	0.505	0.587	1.867	0.072
I'm willing to visit this place again.	Q_d6	-0.371	0.4	-0.255	-0.928	0.361
I am willing to recommend a visit to this place to an acquaintance.	Q_d8	-	-	-	-	-
This place means something to you.	Q_e8	1.509	0.566	1.127	2.665	0.012
Feel a sense of belonging to this place	Q_e9	-0.24	0.496	-0.177	-0.484	0.632
I want to spend more time in this place.	Q_e10	-	-	-	-	-
I'd like to visit this place again.	Q_e11	-	-	-	-	-
Experience in this place is valuable.	Q_f2	-0.141	0.67	-0.107	-0.21	0.835
Experience in this place is more exciting than anywhere else.	Q_f4	0.64	0.359	0.497	1.786	0.085
This place is capable of creating a vibrant environment.	Q_f6	0.794	0.362	0.564	2.192	0.037
Frequency_purpose		-0.237	0.125	-0.292	-1.898	0.068

Sense of place on the measurement element	Parasol Gallery's artists
Discussed model	R <sup>2</sup> =0.608   Adju-R <sup>2</sup> =0.2743 F=1.667   P=0.090

In the case of the variables Q\_d3, Q\_d5, Q\_e8, Q\_f4, Q\_f6 in table 9, frequency positively impacted satisfaction. In contrast to table 8, significant variables were obtained in the group related to experiential value and behavior intention. Table 9 shows a group that was directly involved in the Parasol Gallery event, and it is not to be denied that various emotional factors can affect satisfaction.

In Table 10, variables Q\_d6; Q\_d8; Q\_e9; Q\_e10; Q\_f2 showed a significant positive effect on satisfaction, and that was different from tables 8 and 9. However, the feeling of a sense of belonging to the place had the same effect on satisfaction as in Table 8.

Table 10. Regression Analysis of Group\_C

Sense of place on the measurement element	Parasol Gallery's artists
Dependent variable: satisfaction_location	B SE β t p
1   Constant	3.951 0.734 - 5.382 0
I am willing to keep track of this area.	Q_d3 -0.082 0.151 -0.098 -0.539 0.593
I want to experience this place.	Q_d5 - - - - -
I'm willing to visit this place again.	Q_d6 0.092 0.154 0.099 0.594 0.056
I am willing to recommend a visit to this place to an acquaintance.	Q_d8 0.286 0.152 0.304 1.879 0.067
This place means something to you.	Q_e8 -0.204 0.177 -0.252 -1.154 0.255
Feel a sense of belonging to this place	Q_e9 0.588 0.194 0.649 3.024 0.004
I want to spend more time in this place.	Q_e10 0.262 0.153 0.304 1.72 0.092
I'd like to visit this place again.	Q_e11 - - - - -
Experience in this place is valuable.	Q_f2 0.327 0.165 0.33 1.984 0.054
Experience in this place is more exciting than anywhere else.	Q_f4 0.078 0.172 0.085 0.457 0.65
This place is capable of creating a vibrant environment.	Q_f6 0.146 0.127 0.183 1.155 0.254
Frequency_purpose	-0.237 -0.287 0.078 -0.488 -3.658
Discussed model	R <sup>2</sup> =0.480   Adju-R <sup>2</sup> =0.208 F=1.765   P=0.052

As such, Table 9 and Table 10 have different variables that affect satisfaction. The frequency of visits by each group was not shown to have significant effects in Table 8, but it had a significant effect in Table 9 and Table 10.

### 5. DISCUSSION AND CONCLUSION

This study intended to overcome the analytical limitations of individual elements evident in the previous papers on sense of place. Particularly, physical environment changes positively affect the satisfaction of citizens, but it is not clear which emotional factors affect satisfaction. Thus, it is necessary to interpret the regression results more comprehensively.

First, the frequency analysis result found that the first purpose of visiting the Central Park Promenade and Central Park was shopping in the periphery of the place rather than to enjoy the Parasol Gallery. The citizens visited the place for different purposes, and since then, recognized and participated in

Parasol Gallery. In this case, the main purpose of visiting the original place differed, so various psychological influences were not considered to have a significant effect on satisfaction.

This evidence was found through factor analysis of the citizens' group on a weekday and Parasol Gallery's artists and visitors. Citizens on weekdays had lower average satisfaction than Parasol Gallery's visitors but showed a statistically significant effect. It can be said to correspond with the purpose and meaning of the visit to the place. Additionally, Parasol Gallery's artists were also in line with the first purpose of finding a place, so many significant influencing factors were found, and the average satisfaction was high. In other words, it is difficult to derive significant influencing factors in places or spaces unless the purpose of visit is consistent even if physical changes occur. However, the higher satisfaction of Parasol Gallery's visitors than citizens on a weekday can be attributed to the changes in physical environment created by the Parasol Gallery. It can be discussed in terms of "adjectives of a sense of place," "place meaning," and "place cognition." The term "adjectives of sense of place" is used to find out how people feel emotionally when affected by attributes of a place. These results showed that artists and visitors at the Parasol Gallery are almost identical in terms of the sensory elements felt in places. In place cognition, citizens on a weekday felt commerciality and culturality, but Parasol Gallery's artists and visitors felt symbolism, commerciality, culture character, creativity, and were impressed. Parasol Gallery influenced the change in the sense of place with regard to the Central Park Promenade and Central Park. Therefore, it confirmed that psychological changes occur as places change, going further from the research results of (Baik, 2004) that artificial formation of place ability through events is possible as cultural and artistic activities.

However, further research is needed to confirm that these definitely have a psychological impact on satisfaction. Therefore, through additional study, the theory of the complex structure for place attachment, place image, and cognitive experience in place as the atmosphere of the place needs to be clarified. A further classification of the changes in the sense of place based on negative and positive perceptions related to changes in the physical environment that needs to be done may vary according to changes in the environment into positive and negative perceptions. Additionally, a more thorough examination of the "loss of time perception" factor that did not exist in common in Groups A and B is needed. This study classified the emotional factors felt by subjects under different conditions pertaining to changes in the physical environment. It also analyzed the relationship between the change of emotional factors and experiential recognition of place. Therefore, it is necessary to consider additional factors that affect satisfaction in the physical environment changes.

## **AUTHOR CONTRIBUTIONS**

Conceptualization and methodology and investigation, resources, data curation, writing original draft preparation : C.G, Kim. writing review and editing: C.G, Kim. and D.Y, Kwak. supervision : D.Y, Kwak. All authors have read and agreed to the published version of the manuscript.

## ETHICS DECLARATION

The authors declare that they have no conflicts of interest regarding the publication of the paper.

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