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## **TOURIST SATISFACTION AND PLACE ATTACHMENT: A VALIDATION IN GREEN INFRASTRUCTURE, HANGZHOU, CHINA**

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### **Abstract**

Green infrastructure (GI) constitutes important urban spaces and physical environments that contribute to scenic beauty, recreation opportunities, health, and wellness for tourists. However, the role of GI in tourism has not received much attention. This study aimed to validate the influence of tourist satisfaction on their place attachment in the context of GI. A self-administered survey was conducted at the selected GI locations of prominent tourist sites in Hangzhou West Lake, Zhejiang province, China. A sample of 225 domestic tourists was surveyed using the convenient sampling approach. The data were analysed using correlation analysis, linear regression, and one-way Analysis of Variance (ANOVA) in Statistical Package for Social Science (SPSS) software. The major findings of this study validate the positive and significant influence of tourist satisfaction towards place attachment when tourists visit GI. Further results indicate that tourist satisfaction and place attachment significantly differed regarding education level. The findings provide empirical evidence for a deeper understanding of the role of GI in tourism.

**Keywords:** Green Infrastructure, Tourist Satisfaction, Place Attachment, Hangzhou

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## **INTRODUCTION**

In tourism, green infrastructure (GI) is the key element that forms tourists' feelings and behaviours. It constitutes essential urban spaces and physical environments that provide tourists with leisure, sightseeing, and learning opportunities. GI refers to an interconnected network of green space that conserves natural ecosystem values and functions and offers multiple benefits to human beings (Benedict & McMahon, 2002). It comprises waterways, wetlands, woodlands, wildlife habitats, greenways, parks, ranches and forests, wilderness, and other greenery, along with open spaces in and around the city on all spatial scales. They show aesthetic images to cities by expressing values and beliefs, shaping varied outdoor spaces and landscapes.

Researchers and urban planners worldwide have proven that GI is an efficient and long-term strategy to solve the adverse effects that have emerged along with rapid development, like excessive tourism, gentrification, landscape degeneration, and pollution. As many scholars stated, applying GI can assure environmental safety, address stakeholder conflicts, prevent tourism sites from losing integrity and maintain sustainability (Ramli et al., 2023). However, GI is an indispensable part of tourists' experience during the trip, consciously or spontaneously. Few empirical studies have focused on this field. This study aims to validate whether tourist satisfaction affects their place attachment in GI to give an understanding of GI in tourism. In general, the research objective of this study is to examine the relationship between tourist satisfaction and place attachment in the context of green infrastructure.

## **LITERATURE REVIEW**

### **Green Infrastructure**

Green infrastructure has been defined in various ways, with the three most common approaches focusing on (i) linked green spaces, (ii) urban ecology, and (iii) water management (primarily referring to stormwater management). For example, Benedict and McMahon (2002) see GI as an interconnected green space network that conserves natural ecosystem values and functions and provides associated benefits to human populations. Similarly, Natural England (2011) defines GI as a strategically planned and delivered network comprising the broadest range of high-quality green spaces and other environmental features. In the context of ecology, the European Commission (2014) defined GI "as a strategically planned network of high quality natural and semi-natural areas with other environmental features, which is designed and managed to deliver a wide range of ecosystem services and protect biodiversity in both rural and urban settings". In other cases, GI focused only on stormwater management, explicitly a stormwater management technique as a cost-effective, resilient approach to managing wet weather impacts (Matsler et al., 2021).

The utilisation of GI in the tourism sector is evident in various instances. One such example is the revitalisation of the Cheonggyecheon River, where the conversion of rigid engineering projects into GI has transformed the area into the famous tourist destination, Cheonggyecheon River Linear Park, which boasts a natural and wilderness-like environment. Beyond mitigating flooding risks, urban heat island effects, and local air pollution, it has also emerged as a prominent landmark in Seoul, South Korea. Another compelling illustration of successful GI implementation for transformation is observed in The River of Life project in Kuala Lumpur, Malaysia. The conversion from concrete channelising structures to an appealing green space has turned the river into a noteworthy tourist destination.

### **Satisfaction**

Tourist satisfaction is essential for sustainable tourism management (Latip et al., 2021). Moutinho (1987) notes that satisfaction is primarily a function of pre-travel expectations and post-travel experiences. Similarly, Pizam et al. (1978) define tourist satisfaction as the result of the comparison between a tourist's experience at the destination visited and the expectations about the destination. Del Bosque and San Martín (2008) state that satisfaction is the individual's response to a cognitive process where the consumption experience is compared with his expectations. Others focus on the experience at the destination. For instance, Tse and Wilton (1988) suggest that the tourist evaluation of service does not depend on the gap between the expectation and the performance but on the actual perception of the service. Ozdemir et al. (2012) consider satisfaction composed of affective and cognitive aspects and essentially decided during the visit.

### **Place Attachment**

Place attachment is a positive connection or emotional bond between a person and a particular place (Williams & Vaske, 2003). It has been widely applied to examine the relationship between tourists and destinations. The concept of place attachment has at least two origins. One would be the place theory in geography, which explains the relationship between man and place from human feeling, psychology, culture, ethics, and morality. The other aspect would be attachment theory in psychology, which is an affection bond or a tie between an individual and an attachment figure, a basic human need for security (Bowlby, 1982). Place attachment is an affective bond or link between people and specific places (e.g. Altman and Low, 2012). Within the backdrop of China, Lin et al. (2019) reviewed the research progress of place attachment and proposed that place attachment is the cognitive, emotional, and behavioural connection between people and places.

### **Relationship Between Tourist Satisfaction and Place Attachment**

From the tourism perspective, several studies suggest that satisfaction is a precursor to developing an attachment to a place. For example, research from Ramkissoon et al. (2012) indicates that satisfaction positively impacts place attachment. Similarly, Çevik (2020) reported that park satisfaction positively and significantly affected park attachment. This notion aligns with the insights provided by Halpenny (2006), who reported that satisfaction with various aspects of a national park, including its natural features, social atmosphere, and the conduciveness of activities, contributes significantly to the overall development of place attachment. Accordingly, the following hypothesis is formulated: Tourist satisfaction with GI positively influences place attachment.

## **RESEARCH METHODOLOGY**

### **Study Sites**

The questionnaires were distributed to domestic tourists through a convenient sampling method at the two selected tourist attractions (Su Causeway and Flowery Pond) around Hangzhou West Lake, Zhejiang province, China (as shown in **Figure 1**) from 19th and 20th September 2023. These two sites were chosen from ten famous nationwide sites identified as "the ten scenic spots of the West Lake". Scattered in and around the West Lake, they are the most classic, complete, and influential works of poetically named scenic places, originating from Chinese landscape aestheticism with a prominent associative cultural character. Data collected at these two spots is considered impractical because they are the core attractions, and the viewing places (points) and appreciation themes remain unchanged over ten centuries. Besides, the two locations were chosen because they include a variety of GI (e.g., lakes, ponds, greenways, gardens, and characteristic plants, etc.) along with tourism activities (e.g., sightseeing, boating, fish watching, cycling, etc.). Also, each scenic place has associated literature, historical or artistic works, and stories that represent traditional Chinese culture's spiritual and emotional bonds.



**Figure 1:** The location of Hangzhou West Lake

### **Survey Instrument**

The questionnaire includes 27 questions divided into four sections related to (i) demographics, (ii) travel information, (iii) tourist satisfaction, and (iv) place attachment. This questionnaire explains the concept of GI at the forefront before the questions because people are not familiar with GI, according to related research conducted by Straupe and Liepa (2018). Demographic information (6 items) and travel information (5 items) in this study were from Isa (2017) and Ab Dulhamid et al. (2022). Additionally, satisfaction is assessed using four items from Isa et al. (2022), Minh et al. (2023), and Latip et al. (2021), while place attachment is measured with 12 items adopted from Isa (2020), Xiang and Mohamad (2023).

### **Quantitative Approach**

Following the exclusion of unfinished questionnaires or those filled out with identical responses, the dataset was refined to ensure the inclusion of only valid and complete submissions. Consequently, the adequate sample size for analysis comprises 225 completed questionnaires. This study employed a quantitative approach. The data obtained from the respondents were analysed using descriptive statistics, correlation analysis, simple linear regression, and one-way Analysis of Variance (ANOVA) in SPSS 25.0. The findings were compared and used as a guide in developing criteria and strategies for the tourism development framework in the study area.

## RESULT

### Demographic Characteristics

The respondents' profiles encompass the details of gender, age, marital status, educational level, occupation, and monthly income of each domestic tourist participating in this study, as presented in **Table 1**.

**Table 1:** Sample Demographic characteristics

Characteristics	Classification	Number	Percentage (%)
Gender	Male	133	59.1
	Female	92	40.9
Age	<18	3	1.3
	18 ~ 25	75	33.3
	26 ~ 35	85	37.8
	36 ~ 45	36	16.0
	46 ~ 60	24	10.7
	>60	2	0.8
Marital status	Unmarried	139	61.8
	Married	85	37.8
	Others	1	0.4
Education level	Middle school or lower	1	0.4
	High school or secondary specialised school	23	10.2
	University or college	109	48.4
	Postgraduate or higher	92	40.9
Monthly income (CNY)	<3000	47	20.9
	3000 ~ 4999	19	8.4
	5000 ~ 6999	37	16.4
	7000 ~ 8999	41	18.2
	> 9000	81	36.0
Occupation	Students	30	13.3
	Housewife	4	1.8
	Public sector employee	40	17.8
	Unemployed	6	2.7
	Self-employed	27	12.0
	Private sector employee	88	39.1
	Retired	7	3.1
	Others	23	10.2

Regarding gender, the participation breakdown reveals that 92 (40.9%) respondents are female domestic tourists, while 133 are male tourists. Concerning age, most respondents were between 26 and 35 years old, constituting 85 (37.5%) respondents. The second-largest age group comprises tourists aged 18 to 25, accounting for 75 (33.3%) respondents. As for the description of respondents' marital status, results show that 139 (61.8%) respondents are unmarried, and 85 (37.8%) respondents are married; no one chose "others" in this study. In all, 89.3% of respondents have higher education, namely university or college (48.4%) or postgraduate or higher education (40.9%).

The monthly income among respondents was recorded in Chinese Yuan, CNY (¥). Results show that the highest percentage of monthly income among respondents is more than ¥9,000 (36.0%), followed by 14 (21.2%) respondents who earn less than ¥3,000(20.9%), ¥7,000-8,999(18.2%), ¥5,000-6,999(16.4%), and CNY3,000-4,999 (8.4%). Regarding tourists' employment, the highest percentages were for private and public sector employees (39.1% and 17.8%, respectively). The lowest percentages were for respondents who were housewives (1.8 %).

### Travel information

The travel information of the respondents (refer to **Table 2**) contains their origin, travel information, motivation to visit, time(s) of visit, and their main activities.

**Table 2:** Travel information

Characteristics	Classification	Number	Percentage (%)
Origin	Hangzhou	27	12.0
	Other cities of Zhejiang Province	14	6.2
	Jiangsu, Anhui Province or Shanghai	38	16.9
	Other provinces of China	146	64.9
	Travel Companion	Alone	37
	With tour group	7	3.1
	With families	65	28.9
	With friends	106	47.1
	Others	10	4.5
	Motivation	Sightseeing and vacation	170
Visit relatives or friends		21	9.3
Learn knowledge		14	6.2
Attend meetings or activities		4	1.7
Religious purposes		17	7.6
Shopping		17	7.6
Others		20	9.1
Time(s) of visit	1	85	37.8
	2	44	19.6
	3	34	15.1
	≥4	61	27.2
Main activities	Sightseeing	174	77.3
	Relaxation	153	68.0
	Socialising	44	19.6
	Taking photos	146	64.9
	Cycling	24	10.7
	Walking	170	75.6
	Other activities	4	1.7

Results from the travel information analysis of respondents found that the majority of respondents (64.9%) came from other provinces of China, followed by 38 (16.9%) tourists from Jiangsu, Anhui Province, or Shanghai (the

Yangtze River Delta areas). 27 respondents (12.0%) came from Hangzhou. Correspondingly, 14 (6.2%) came from other cities of Zhejiang province.

Out of 225 respondents, 106 (47.1%) respondents travelled with friends. Respondents who travelled with families accounted for 65 (28.9%). The number of tourists who travelled alone and with a tour group were 37 (16.4%) and 7 (3.1%), respectively. Most tourists came motivated by sightseeing and vacation (75.6%). While respondents visit Su Causeway and Flowery Pond for meetings or activities, they are the least. The repeat tourists are 62.2%, compared to the first-time visitors who are 85 (37.8%). In addition, the main activities in Su Causeway and Flowery Pond were sightseeing (77.3%), followed by walking (75.6%), relaxation (68.0%), and taking photos (64.9%).

### **Validation of Hypothesis**

#### ***Correlation analysis***

According to Fricker and Hengartner (2001), correlation can be defined as a statistical measure that helps to discover the extent of the relationship between two or more variables or even factors. Pearson Correlation Analysis was adopted in this research to show the significant correlation between tourist satisfaction and place attachment.

Based on Table 3, the results show a significant and positive correlation between tourist experience and place attachment, which is 0.742. Thus, it can be concluded that the relationship between the independent variable (tourist satisfaction) and the dependent variable (place attachment) is significant.

**Table 3:** Correlation analysis of tourist satisfaction and place attachment

	<b>Place Attachment</b>	<b>Tourist Satisfaction</b>
Place Attachment	1	
Tourist Satisfaction	.742**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

#### ***Regression Analysis***

To test the research objective further, this study conducted a simple regression analysis using SPSS 25.0 to determine the effect of tourist satisfaction on place attachment. The results are presented below in Table 4, in which the R<sup>2</sup> indicates the degree of variability in the target variable explained by the model or independent variables. In this study, the value is 0.550, which means that the independent variable (tourist satisfaction) explains 55.0% of the variation in the dependent variable (place attachment), which was 0.550, representing 55.0%. The F-value of 78.186 was significant at the 0.001 level, indicating that the fit of the regression model in this study is promising. Thus, tourist satisfaction ( $\beta = .685$ ;  $p < 0.05$ ) positively impacted place attachment. The relationship between tourist satisfaction (TS) and place attachment (PA) can be described by the following simple linear regression equation:  $PA = 0.685 * TS + 1.044$



Therefore, it can be concluded that tourist satisfaction can positively influence place attachment to a degree of 68.5%. This result aligns with Ramkissoon et al. (2012) and Çevik (2020), who also confirmed the positive impact of tourist satisfaction on their place attachment.

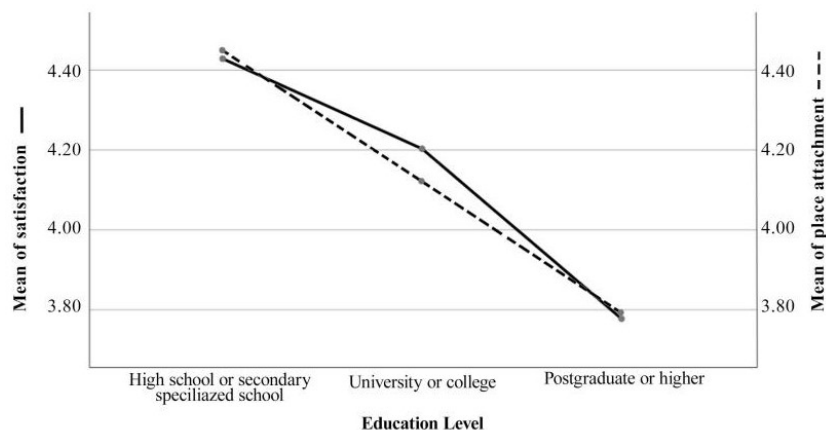
**Table 4:** The regression results among tourist experience and satisfaction on place attachment

Independent Variable	Unstandardised Coefficients		Standardised Coefficients	t-Value	Sig.
	B	Std. Error	Beta		
(Constant)	1.044	.318		3.279	.002
Tourist Satisfaction	.685	.078	.742	8.842	.000
R <sup>2</sup>	.550				
F Value	78.186				
P-value	<0.001				

Note: The dependent variable is place attachment.

#### Further Analysis of Tourist Satisfaction and Place Attachment

To compare the performance of demographics on tourist satisfaction and place attachment, a one-way Analysis of Variance (ANOVA) was carried out. The Scheffe post hoc test located the significant differences among the education levels. The results of multiple comparisons are presented in **Figure 2**. It revealed that the differences between "High school or secondary specialised school" and "postgraduate or higher" (Sig = .010) and between "university or college" and "postgraduate or higher" (Sig = .035) were significant. The other differences in demographics were not statistically significant in this study. "High school or secondary specialised schools" and "universities or colleges" performed significantly better than postgraduate or higher on the satisfaction and place attachment post-test. This result is consistent with Ma et al. (2018), who also concluded that education level was negatively correlated with tourists' satisfaction with management and educational value among Chinese tourists.



**Figure 2:** Multiple comparisons of education level on satisfaction and place attachment

## CONCLUSION

The following conclusions can be drawn from the collected data and tests that were conducted. The motivation for domestic tourists to visit Su Causeway and Flowery Pond is predominantly centred on sightseeing and vacation. The results indicate that the primary activities at selected sites included sightseeing and walking, relaxation, and photography. For domestic tourists, tourist satisfaction and place attachment play crucial roles when visiting GI. Also, consistent with previous studies, the relationship that tourist satisfaction exhibits a positive and significant influence on place attachment is validated in the context of GI tourism. Furthermore, it is noteworthy that there were substantial differences in both satisfaction and place attachment based on education levels, a distinction not observed in other demographic factors. The result indicates that the higher-educated population showed lower satisfaction and attachment to the GI they visited. It is hoped that future research can make a horizontal comparison of different types of GI to understand its role in tourism further because this research only focuses on the people-place relationship, not the feature of physical characteristics.

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