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LANDSCAPE ATTRACTIVENESS AND PLACE IDENTITY: CONSIDERING THE ROLE OF URBAN PARKS

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Abstract

Urban parks, vital public spaces for community health and well-being, also face challenges related to safety and security. Balancing the need for recreational spaces with ensuring safety is paramount for urban stability. However, existing research on the nexus between landscape attractiveness and perceived safety often overlooks the influence of factors such as park usage patterns, place identity, and park typologies. To address this research gap, we conducted a survey among 411 urban park users and employed SmartPLS and SPSS for data analysis. Our findings reveal a robust correlation between landscape attractiveness and perceived safety. Furthermore, we uncover that the combined influence of place identity and time spent in the park can serve as positive mediators in this relationship. Surprisingly, our analysis indicates that time spent in the park alone does not exert a significant mediating effect. Notably, our results highlight nuanced variations: the association between landscape attractiveness and place identity is particularly pronounced in parks with lower landscape attractiveness, while the mediating role of place identity on the relationship between park usage time and perceived safety is more pronounced in parks with higher landscape attractiveness. These findings contribute to our understanding of how urban park landscapes relate to perceived safety and provide new insights for improving the safety of urban parks, offering valuable insights for urban planners and public health policymakers in designing healthier urban environments.

Keywords: Landscape Attractiveness, Perceived safety, Place Identity, Time Spent in the Park, Different Urban Parks

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INTRODUCTION

Urban parks, as essential public recreational spaces, play a critical role in ensuring the well-being of urban residents (Sabri & Ponrahono, 2024). However, urban parks, as primary venues for outdoor recreational activities, not only attract individuals seeking daily leisure and exercise but also potentially attract potential criminal elements (Mak & Jim, 2022). Consequently, studies have investigated factors within parks that contribute to fear of crime (Mak & Jim, 2022; Sreetheran & van den Bosch, 2014). Nonetheless, there remains a significant scope in understanding what factors would help enhance individuals' perceived safety (PS) in terms of crime from the physical environment. For instance, the relationship between the landscape attractiveness of urban parks and PS warrants further exploration.

In environmental psychology, frequent visits to urban parks are associated with greater benefits derived from these spaces (Chen & Marzbali, 2023). Research on crime perception indicates that frequently visiting a particular place can foster a sense of ownership and familiarity, which would benefit people's PS in that place (Barker et al., 2022). However, there is still a lack of clear and specific empirical evidence on how the time spent in the park and place identity influence park users' PS in urban parks. Therefore, unlike previous studies that primarily explored factors evoking fear of crime in urban parks, this research aims to investigate the relationship between urban park landscape attractiveness and PS, considering the influence of time spent in the park, place identity, and different types of urban parks. The goal of the study is to verify that, in addition to increasing park visitation, the attractiveness of urban park landscapes also has a positive impact on PS. The findings will provide important insights for enhancing urban safety and promoting sustainable development through the construction of attractive urban park landscapes.

LITERATURE REVIEW

Landscape Attractiveness and Perceived Safety

Studies that have been conducted exploring the factors influencing fear of crime have found that urban parks' negative aspects (e.g., syringes, drunken persons, hiding spaces) would evoke fear of crime (Mak & Jim, 2018; Sreetheran & van den Bosch, 2014), as well as the high vegetation coverage has been shown to have negative consequences on PS, particularly due to its influence on visibility (Hami & Emami, 2015; Hosseinalizadeh et al., 2022). Such feeling of environmental insecurity also further influences people's visitation to parks (Kiplagat et al., 2022). However, parks with attractive landscapes can promote visitation (Sun et al., 2024). Given the inherent correlations in the aforementioned research findings, it is theoretically plausible that landscape attractiveness is positively correlated with PS, while limited evidence has clearly confirmed this relationship. Additionally, existing research has found that if parks do not create a clear layout

and include hidden places that are difficult to recognize as dangerous when constructing attractive park landscapes, even if the natural value of the park's greenery is high, the park may remain unpopular (Lis et al., 2022), posing a challenge to verifying the relationship. Therefore, this study considers overall attractiveness, rational layout and accessibility of the landscape, and diversity and aesthetics of landscape combinations as the components of landscape attractiveness (Li et al., 2023; Mao et al., 2022; Vannoppen et al., 2021), to test the relationship between landscape attractiveness and PS (Hypothesis 1), aiming to address the aforementioned issues and identify tangible physical factors for enhancing the sense of safety in urban parks.

Hypothesis 1: Landscape attractiveness has a significant positive relationship with perceived safety.

Time Spent in the Park and Place Identity

Relevant research in environmental psychology has established that time spent in the park reinforces the benefits individuals derive from urban parks (Chen & Marzbali, 2023). The impact of landscape attractiveness on park visitation is also well-documented (Ginting et al., 2017; Lin et al., 2023). However, there remains a gap in research regarding whether the time spent in the park strengthens the relationship between landscape attractiveness and PS.

Existing literature suggests that frequent visitors to public spaces feel safer due to enhanced natural surveillance and a sense of ownership and familiarity (Barker et al., 2022; Ceccato & Nalla, 2020; Lomas et al., 2023). However, whether the concept of place identity, defined as recognizing a particular place as a part of who I am, can also be equated with the meanings of ownership and familiarity, thus playing a mediating role in the relationship between landscape attractiveness and PS, remains uncertain. Therefore, to address this gap, Hypothesis 2 is proposed, aiming to provide new insights into the factors influencing PS in urban parks.

Hypothesis 2: The relationship between landscape attractiveness and perceived safety is positively and significantly mediated by time spent at the park and place identity.

Office Workers and Baise Two Urban Parks

Younger individuals express greater concerns about personal crime compared to older adults (Jackson, 2009). However, the urban park usage patterns of younger demographics, particularly young office workers, who are constrained by fixed working hours, spend less time in parks and experience place identity differently than the elderly (Bufquin et al., 2021; Shobri et al., 2021), have received insufficient attention. Even some studies found that urban green space is

recognized mainly by the elderly, the instrumentalization of urban green spaces by young people and not their recreational or naturalistic use (Egea-Cariñanos et al., 2024). These situations highlight the need to focus on young office workers in research, such a focus will also enhance our understanding of how urban park environments influence perceived safety across diverse user groups.

In the existing literature on urban parks in China, research has predominantly concentrated on large cities, with limited attention to young office workers in smaller cities. Baise City serves as a pertinent example of such smaller cities, it has two comprehensive urban parks catering to the daily recreational needs of its residents: Peninsula Park and People Park (**Figure 1**). We observed the different usage of young office workers in two urban parks of Baise, as well as the distinction of landscape environment and found two issues that have not been fully researched.



Figure 1: Map of the study area and its landscape photos

Note: A: People Park; B: Peninsula Park.

Source: Maps from Google Earth, 2022. Landscape photos taken by the first author (2022).

Peninsula Park, a new and modern facility centrally located in a newly developed district, is encircled on three sides by the Youjiang River. Its scenic views and open landscape enhance natural surveillance and PS, attracting many young people to picnicking on weekends. Conversely, People Park, a historic

park in the old city centre, is smaller with outdated facilities and dense vegetation, which can increase the fear of crime (Hosseinalizadeh et al., 2022). Despite its age, People Park holds a special place in the hearts of local residents due to its landscapes that carry locals' childhood memories. It has a distinctive children's playground, and on weekends, many young parents can be seen gathering there with their children. Given the distinct landscape characteristics of these two parks, it is uncertain which park would better enhance place identity and PS among young office workers. Additionally, the literature has not thoroughly investigated the varying mediating role of place identity in the relationship between landscape attractiveness and PS across different urban parks.

This study proposes the following two hypotheses to address the identified research gap, focusing on Baise City's People Park and Peninsula Park as study areas (**Figure 1**). The objective is to provide valuable insights for enhancing urban park safety in Baise and other similar small cities in China. By examining the differences in how various urban parks influence PS, this study aims to contribute to a broader understanding of urban park usage and safety perceptions across diverse urban contexts and different demographic groups. The findings are expected to inform urban planners and landscape architects in designing safer and more inclusive urban green spaces.

Hypothesis 3: Landscape attractiveness, time spent in the park, place identity, and perceived safety vary between Peninsula Park and People Park.

Hypothesis 4: The associations between the study variables differ between Peninsula Park and People Park.

Figure 2 depicts the proposed model based on the hypotheses, which investigates the relationships between urban parks' landscape attractiveness, time spent in the park, place identity, and PS, considering the influence of Peninsula Park and People Park.

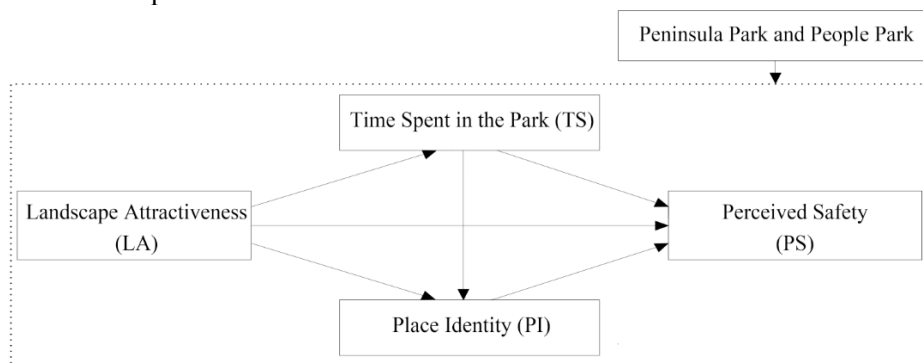


Figure 2: The theoretical model
Source: Authors (2023)

RESEARCH METHODOLOGY

This research utilizes quantitative methods, employing questionnaires, as Table 2 shows to collect data from office workers aged 18 to 40 who have visited People Park or Peninsula Park in Baise City (All-China Youth Federation, 2020). The questionnaire consists of three sections: participants' demographic information, time spent in the park, and the measurement of study variables (landscape attractiveness, place identity, and PS). Time spent in the park is measured by visit frequency and duration. All items related to the study variables are adapted from relevant literature and scored on a 5-point Likert scale ranging from 'strongly disagree (1)' to 'strongly agree (5)'.

Table 1 shows the measurement items for landscape attractiveness, which includes six aspects related to the park's visual attractiveness such as beauty, layout, variety, and aesthetic harmony, contributing to a playful and sequenced landscape experience. Place identity is assessed through five items, focusing on the emotional and psychological bonds individuals form with specific places, reflected in memories, connections, and impacts on well-being. PS is measured by five items, assessing feelings of safety from crime in the park including comfort walking alone, PS at night, and overall fear of crime.

Sampling was conducted using a stratified random sampling method. Data collection took place from May to June 2023, with questionnaires administered both online and face-to-face in urban parks. An a priori analysis was conducted using the G-Power T-Test to determine the minimum number of participants needed for valid results. With an effect size of 0.3, a test power of 0.80, and a significance level of 0.05, a total of 352 participants (176 per park) were considered sufficient for statistical significance (Kang & Huh, 2021). However, to account for factors such as time, financial resources, and investigator involvement, a total of 411 valid responses were collected, with 212 from Peninsula Park and 199 from People Park. Among the participants, 68.37% were female, and 57.18% were married. Additionally, 83.45% of participants had a university/college education. In terms of occupation, 48.9% were public institution personnel, 45.5% were enterprise personnel, and 5.6% were classified as other occupations. In People Park, the proportion of office worker visitors aged 31-40 years old (51.2%) exceeded those aged 18-25 years (48.8%). In Peninsula Park, the proportion of office workers aged 18-30 (57.8%) was higher than that of office workers aged 31-40 (42.2%). This suggests that young office workers are more inclined to visit Peninsula Park than People Park.

After data collection, the study employed the PLS-SEM (partial least squares structural equation modelling) technique using PLS 3.0 to analyze the data to verify hypotheses 1 and 2 (Hair Jr et al., 2021). Furthermore, we employed the multiple group analysis (MGA) method in SmartPLS to explore variations in these relationships between Peninsula Park and People Park (verify hypothesis 4). In SPSS 26, chi-square tests were used to assess the associations between the

two urban parks and the participants' time spent in the park, while t-tests were employed to evaluate differences in landscape attractiveness, place identity, and PS between Peninsula Park and People Park (verify hypothesis 4).

Table 1: The study constructs and measurement items

Variables	Item code	Item	Source
Landscape attractiveness (LA)	LA1	The park landscape is very attractive to me.	(Li et al., 2023; Ma, 2021; Mao et al., 2022; Qi et al., 2017; Wei et al., 2022)
	LA2	The park landscape is beautiful.	
	LA3	Reasonable and easily accessible layout of the park landscape.	
	LA4	The park has various types of landscapes, and each has its characteristics.	
	LA5	Water, terrain, plants, pavement, roads, structures, and landscape features are well combined and aesthetically pleasing in the park.	
	LA6	The park landscape is playful and has a sense of landscape sequence.	
Place identity (PI)	PI1	I have a lot of fond memories of the park.	(Bazrafshan et al., 2023; Dasgupta et al., 2022; Li et al., 2023; Mao et al., 2022; Powers et al., 2022)
	PI2	I miss the park when I am away for a long time.	
	PI3	The park reminds me of some of my loved ones (parents, children, friends, etc.).	
	PI4	This park has a special meaning to me.	
	PI5	The urban park has a lot of impacts on my health and well-being.	
Perceived safety (PS)	PS1	I feel safe in the park in terms of crime.	(Böcker et al., 2023; Cozens & van der Linde, 2015; Luyk, 2022; Morgan et al., 2017)
	PS2	I wouldn't mind walking along this park unaccompanied.	
	PS3	This park is generally safe at night.	
	PS4	I didn't fear crime in this park.	
	PS5	I wouldn't quickly escape from this park due to fear of crime.	

Source: Authors (2023)

RESULTS

Measurement Model

The statistics generated based on the theoretical model in Smart PLS are used to evaluate the reliability and validity of the constructs. All the item factor loadings (ranging from 0.775 to 0.876) exceeded the recommended threshold of 0.7, all Cronbach's alpha coefficients (ranging from 0.903 to 0.909) surpassed the acceptable threshold of 0.70, the composite reliability values (ranging from 0.789 to 0.929) also exceeded the generally accepted benchmark of 0.70, the Average

Variance Extracted (AVE) values (range from 0.652 to 0.721) exceeded the minimum criterion of 0.5, indicating that the constructs demonstrated convergent validity (Hair Jr et al., 2021).

On the other hand, the discriminant validity between constructs was assessed using the Heterotrait-Monotrait Ratio (HTMT), with all HTMT values below the recommended threshold of 0.85, indicating good discriminant validity between constructs. Additionally, according to the Fornell-Larcker criterion, the Average Variance Extracted (AVE) for each construct was higher than its correlations with other constructs, further confirming the construct validity.

In **Table 2**, the R^2 value for the dependent variable, PS, was 0.217, indicating that the model explains 21.7% of the variance in perceived safety. All Q^2 values of study variables were over 0 indicating that the PLS path model has predictive relevance and meaningful predictive accuracy (Hair Jr et al., 2021). Finally, the goodness-of-fit calculation (GoF), was significantly exceeded the threshold of 0.36, indicating that the model performs well in explaining the data structure and is capable of effectively capturing the relationships within the observed data (Hedayati Marzbali et al., 2016).

Table 2: Coefficient of determination and predictive relevance and GoF

Constructs	Q^2	R^2	AVE (≥ 0.5)	GoF
Landscape attractiveness	--	--	0.686	$= \sqrt{(R^2 * AVE)} =$ $\sqrt{(0.263 * 0.695)} = 0.427$
Time spent in the park	0.092	0.145	0.652	
Place identity	0.298	0.428	0.721	
Perceived safety	0.152	0.216	0.72	

Source: Authors (2023)

Hypotheses Testing Results

The study's hypothesis 1 and 2 testing results are displayed in **Table 3**. Landscape attractiveness has a positive and significant relationship with the PS ($\beta = 0.282, p < 0$). Place identity ($\beta = 0.133, p < 0$), or time spent in the park and place identity ($\beta = 0.018, p < 0.01$), can act as positive and significant mediators in strengthening the relationship between landscape attractiveness and perceived safety. Notably, the time spent in the park was found to have no mediating effect on the relationship between landscape attractiveness and PS ($\beta = -0.008, p > 0.1$), as the time spent in the park showed no relationship with PS ($\beta = -0.023, p > 0.1$).

Table 3: Results of Hypothesis

Hs	Relationships	β	p-value	Direct relationships p-value	Total effects p-value	Type of mediation
H1	LA → PS	0.282	0***	--	--	--
H2	LA → TS → PS	-0.008	0.694	0****	0***	Direct-only (no mediation)
	LA → PI → PS	0.133	0***		0***	Complementary mediation
	LA → TS → PI → PS	0.018	0.003***		0***	Complementary mediation

Note: * p < 0.10, ** p < 0.05, *** p < 0.01.

Source: Authors (2023)

Table 4: Comparison of model relationships between People Park and Peninsula Park

Relationships	Peninsula Park		People Park		Path Coefficients-diff	P-Values Permutation	P-Value MGA
	β	95% CI (two-tailed)	β	95% CI (two-tailed)			
LA → PI	0.456	[0.337;0.561]	0.599	[0.494;0.685]	-0.143	0.054*	0.053*
TS → PI → PS	0.079	[0.035;0.143]	0.025	[0;0.072]	0.054	0.081*	0.082*

Note: Peninsula Park (n = 212) and People Park (n = 199). CI, confidence interval. * p < 0.10, ** p < 0.05, *** p < 0.01.

Source: Authors (2023)

Results of Hypothesis 3. Independent-sample t-test results demonstrated that participants at Peninsula Park reported significantly higher levels of landscape attractiveness ($M=0.414$, 95%CI [0.302, 0.526], $t(409)=7.281$, $p<0.001$), place identity ($M=0.372$, 95%CI [0.229, 0.516], $t(409)=5.106$, $p<0.001$), and perceived safety ($M=0.152$, 95%CI [0.012, 0.29], $t(409)=2.133$, $p=0.033$) compared to participants at People Park. Additionally, chi-square analyses revealed a significant relationship between the type of urban park and both visit frequency ($\chi^2(6) = 23.871$, $p<0.001$) and visit duration ($\chi^2(4) = 33.270$, $p<0.001$). Overall, the majority of office workers visited Peninsula Park weekly (34.3%), whereas People Park was primarily frequented 2-5 times annually (27.1%). Furthermore, 59% of visitors stayed at Peninsula Park for over an hour, while only 36.6% did so at People Park.

Results of Hypothesis 4. Our study validated that the measurement invariance, assessed using the Measurement Invariance Assessment (MICOM) in PLS 3.0, met the criteria for multi-group analysis (Barroso et al., 2018; Chin & Dibbern, 2009; Henseler et al., 2009). The MGA p-value and the permutation test p-value for differences in path coefficients were both below 0.1 (two-tailed),

indicating a significant difference at the 1% level between the two groups. **Table 4** shows that the relationship between landscape attractiveness and place identity was stronger in People Park compared to Peninsula Park. Notably, the mediation of place identity in the relationship between time spent in the park and PS was stronger in Peninsula Park than in People Park.

DISCUSSION

Although the public recognizes the significant health benefits provided by urban parks, they also acknowledge certain risks or disservices associated with urban trees (Egea-Cariñanos et al., 2024). Compared to park elements that induce feelings of insecurity related to crime (Mak & Jim, 2018), this study found that attractive, well-designed, beautiful, diverse, and sequential park landscapes can positively influence participants' PS. This finding offers an alternative perspective to previous research indicating that crime risk is a factor deterring public institutions from planting trees in parks and along streets (Gwedla et al., 2024). It suggests that through thoughtful landscape design, the natural environment of parks can be constructed to enhance users' sense of safety.

Contrary to previous studies (Salleh et al., 2022), this study found that frequent visits to urban parks did not enhance participants' sense of safety. Instead, their PS was more influenced by the physical attractiveness of the park's landscape and their place identity. This finding is similar to the study of Zhao et al. (2024), who reported that higher satisfaction with green spaces is linked to greater subjective well-being, independent of the frequency of visits. Our study enhances the understanding that the frequency of urban park use does not directly correlate with some types of benefits, indicating that the factors influencing the benefits derived from public spaces are diverse and cannot be solely dependent on encouraging frequent park visits.

A notable finding is that time spent in the park can influence place identity, and together they serve as multiple mediators to strengthen the relationship between landscape attractiveness and PS. Building on previous studies (Barker et al., 2022; Ceccato & Nalla, 2020), our research further reveals that place identity alone can be an effective mediator, enhancing the link between landscape attractiveness and PS more effectively than time spent in the park. This finding diverges from and expands on Shadi et al. (2024), showing that while environmental diversity does not have a significant indirect link to safety, combining diverse landscapes with well-designed attractions positively impacts safety perception. Additionally, our study builds on the understanding that landscape readability influences safety through sociability and environmental responsiveness, highlighting that place identity can also reinforce the relationship between landscape attractiveness (or time spent in the park) and PS. This finding enriches the understanding of multiple mediating relationships between park landscapes and safety perception.

Evidently, Peninsula Park outperforms People Park in terms of landscape attractiveness, place identity, and PS among study participants. Surprisingly, however, landscape attractiveness had a stronger impact on place identity in People Park, likely due to its historically significant landscapes. This finding supports previous research showing that old parks hold significant identity value for historical residents (Rosenbluth et al., 2024). Interestingly, the positive moderating effect of place identity on the relationship between time spent in the park and PS was stronger in Peninsula Park. This suggests that, despite People Park's historical significance enhancing place identity, Peninsula Park's larger size, higher landscape attractiveness, and more frequent visits by participants made the mediation effect more pronounced. This finding further corroborates that not only do the health effects of urban park use vary with park types (Lin et al., 2023), but also the safety perception derived from park use via place identity varies with different urban parks.

CONCLUSION

This study, conducted in two urban parks in Baise City, explored the relationships among landscape attractiveness, time spent in the park, place identity, and PS based on environmental psychology. Through the analysis of questionnaire data using SmartPLS 3.0 and SPSS 26.0, significant empirical evidence of relationships between landscape attractiveness and PS among young office workers was found, generally supporting the hypotheses. Notably, place identity positively strengthens the relationship between landscape attractiveness and PS, while time spent in the park has no significant mediating effect on this relationship. Although the landscape attractiveness is higher in Peninsula Park, the relationship between landscape attractiveness and place identity is stronger in People Park due to its historical significance. However, the PS derived from park use via place identity is stronger in Peninsula Park than in People Park. Considering the differences in study contexts, future studies could investigate the relationship between landscape attractiveness and perceived safety in various urban settings to ensure the generalizability of the results across different geographical and cultural contexts.

This study provides valuable insights into enhancing the safety perception of urban parks. Conducted in Baise, China, the findings apply to many similar small cities across the country and can inform the safe development of urban parks in these areas. The study findings support the broader goal of building a safer China (The State Council of China, 2021).

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