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# **Exploring the Impact of Psychological Accessibility on the Restorative Perception in Urban Forests: A Case Study of Yuelu Mountain, Central China**

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Abstract: The recreational and restorative functions of urban forests are gaining increasing attention as people focus more on having a higher quality of life. While the rationale behind the spatial layout of urban forest parks is important, the real psychological perceptions of users cannot be ignored. This study has developed a structural equation model to examine the relationship between environmental restoration and psychological accessibility. Specifically, an empirical study was conducted on a random sample of visitors of the Yuelu Mountain, Central China, to investigate the effect of visitors' psychological accessibility on their environmental restorative perception. The results show that psychological accessibility and the quality of experience have a significant positive effect on the perceived effectiveness of environmental restoration. Environmental attitudes indirectly influence the effect of environmental restorative perceptions through psychological accessibility and the quality of experience. Finally, comments on the development of green space planning in urban forest parks are also presented in this paper.



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**Copyright:** © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). **Keywords:** forest recreation; urban forestry; environmental attitude; psychological accessibility; experience quality; restorative environments; Yuelu Mountain

# 1. Introduction

Due to economic development, globalization, urbanization, industrialization, and social progress, people's standard of living has also improved. According to UN-Habitat, the proportion of the global urban population is expected to rise from 56% in 2021 to 68% in 2050, once again, posing challenges and opportunities for urban life [1]. Spatially, cities are spreading from the center to the periphery, creating inextricable links between urban and neighboring areas for leisure and recreation. Land use forms, adapted to the needs of urban dwellers for short-term leisure and recreation, are constantly being emphasized and developed [2]. However, development is also a double-edged sword. For example, with rapid development and progress, people have to deal with a lot of mental pressure in maintaining their survival. Many city dwellers are experiencing various physical and psychological problems as a result [3-5]. At the same time, the outbreak of COVID-19 in 2020 has forced people to adapt to new lifestyles in many ways [6,7]. For example, a focus on the health benefits of green spaces in the living environment has been found to be conducive in improving public health in settlements in the post-pandemic era and positively intervening in people's psychological crisis [8]. As a major recreational space for urban residents, urban forests will play an important role in promoting the physical and mental health, and maintaining the social well-being of urban residents in the postpandemic era. Therefore, healthy urban living will inevitably become the focus of attention in the post-pandemic era [9].

Since the 20th century, the study of restorative environments has become one of the main focuses of scholarly work in the fields of environmental psychology, public health, and urban planning. The concept was first introduced in the field of environmental psychology, with Kaplan [10] defining it as an environment that enables people to better recover from mental fatigue and stress, and Hartig [11] further defining 'restoration' as the regaining of physiological, psychological, and social capacities that have been depleted in the process of adapting to the environment. It is clear that the study of restorative urban environments is an interdisciplinary field of research based on environmental psychology, with public health as its goal, and urban spatial design as its orientation.

The study of restorative perception includes the research of restorative effectors, effector objects and effector mechanisms [12–14]. Recent studies in this field have shown that the restorative experiences offered by urban green spaces can influence the physical and mental health of urban dwellers in a positive way, helping improve mood and relieve mental stress [14–16]. Furthermore, the study of restorative urban environment subjects focuses on the types of urban environments and environmental elements that have a potential restorative effect on the health of residents. For example, urban green spaces with a high degree of naturalness and safety are often more likely to induce restorative perceptions [17,18]. The study of the effect of the object of restoration focuses on the extent to which the restorative environment affects different groups of people physically and mentally. An example of this is looking at the restorative effects of restorative environments on different groups of urban residents [19–21]. Some studies have shown that restorative environments may have better restorative effects on vulnerable groups such as the sick, women, children, and the elderly. These groups are usually more stressed and vulnerable to physical and mental fatigue in their daily lives than the general population. The mechanism of effect examines the interaction between the subject and the object, and explores the impact of different interacting factors on the operation of the mechanism. Herzele et al. [22] found a positive impact of place memory on restorative effects. That is, the reasons people enter a landscape are rarely related to the color or shape of the place itself, but rather they do it to find similar perceptual experiences that they can get in the natural environment. Many other scholars have also explored the perception of restorative green spaces by looking for a general consensus of preference [23] and a sense of attachment to a place [24], and all have revealed that the interaction between individuals and their environment is significantly related to the restorative effects of the environment [25].

There has been a growing awareness of the importance of urban green spaces, which has led to increased attention and demand for such areas [26]. However, not all urban dwellers have access to pristine urban green spaces to pursue a higher quality of restorative perception experiences as they would like to in their daily lives. For the general public, the most accessible natural environment is the urban green space represented by urban forest parks [4,27]. However, the development of urban land is very limited and many of the available green spaces are not being used for their functions. This also means that we must change our mindset and not only focus on the quantity and size of urban parks alone, but also on the quality of the parks and improving the utilization of green spaces, as well as playing a key role in building a healthy urban life to truly meet people's demands for green spaces [28–31]. Therefore, we must understand the psychological mechanisms behind people's willingness to go to parks, in order to help people engage in recreational behavior more easily and quickly, to maximize the performance of urban parks. It is generally accepted that the higher the accessibility of a park, the greater its performance and the higher the health benefits to people. In fact, accessibility is a complex and flexible concept that has been interpreted in different ways across different fields and by different research subjects [32,33]. Some of the most widely used definitions are: the number of target objects that can be obtained or approached within a given spatial area [34]; the ease of overcoming spatial resistance [35]; and the potential for interaction between points in space [36].

The value of an urban park is largely determined by how people use it, and whether people 'want to use it' depends on non-physical (i.e., psychological, perceptual, subjective,

etc.) factors, such as satisfaction and the suitability of the facility to their needs [37,38]. In most studies, accessibility is measured by physical factors such as transport, type, size, and economics condition [39]. Clearly, these studies do not reflect the perceptions of the general public, but perceptions and attitudes often influence their decisions [40,41], which in turn may influence the quality of their experience. According to Vaske and Donnelly [42], as outlined in their cognitive hierarchy model of human behavior, the process of structuring people's perceptions of the environment is divided into an inverted pyramid consisting of people's values, value orientations, attitudes and norms, behavioral intentions, and behaviors [43,44]. Each element is layered on top of the other. Values provide the basis for attitudes and beliefs, which in turn influence the ultimate behavioral intentions and the experience of the actual behavior. In Ajzen's theory of planned behavior (TPB) [45], it is argued that behavioral intention is the most direct factor influencing behavior and that behavioral intention is in turn influenced by attitudes, subjective norms and perceived behavioral control. These theories significantly improve the explanatory and predictive power of research on behavior and argue that attitudes are the most central concept in the theory of planned behavior [46]. Similarly, in the field of human–earth relations, there are complex pathways of influence among attitudes, beliefs and behaviors within people's environmental awareness and pro-nature mentality. In this era of increasing human influence on the ecological environment, it is important to have a deeper understanding of how and why people value forest recreation. This can also enable forest park managers to take action to improve the social acceptance of forest recreation. Thus, people's environmental attitudes and psychological factors should be considered in the planning and management of urban forest parks. This also reveals that the traditional study of park accessibility, which relies on physical distance measures, has major limitations from the perspective of activity selection. If positioned purely to enhance spatial accessibility at a macro scale, it may ultimately enhance the quality of physical elements of a system, such as accessibility to transportation, but may not maximize the psychological needs of people [47,48]. In studies of environmental restorative perceptions, the quality or characteristics of restorative environments are often investigated in relation to individual restorative perceptions, and the role of individual and social variables in psychological restoration is often overlooked [49]. In order to improve the inclusiveness of urban green space recreation, we should understand users' environmental attitudes, psychological accessibility, and their real experiential feelings [50,51]. In the field of leisure tourism, Otto and Ritchie [52] also define the 'quality of experience' as an affective component of experience that includes subjective, emotional, and personal responses to various aspects of service development, ultimately leading to overall satisfaction [52,53]. In the context of tourism, service quality refers to the performance of services at the attribute level, while the quality of experience refers to the psychological outcome of a tourist's participation in a tourism activity [54], which is the cognitive–emotional state [55] that an individual derives from the tourism experience.

Therefore, the main objective of this study is to investigate the relationship between psychological accessibility and environmental attitudes toward environmental restorative effects, and to understand users' subjective perceptions and needs from a more microscopic perspective, through individual perception-based accessibility studies. This is important in order to provide an empirical basis for improving the spatial layout and utilization of parkland, to maximize the performance of urban green spaces and their restorative effects on people. We attempt to determine the impact of psychological accessibility on the restorative effects of the environment by answering two research questions: (1) Do people's different attitudes toward the environment influence the level of psychological accessibility and the quality of experience? (2) Does the level of psychological accessibility influence the effectiveness of environmental resilience?

#### 2. Hypothesis Derivation and Methods

#### 2.1. Environmental Attitudes and Psychological Accessibility

An important step in understanding how people interact with their environment is to measure their attitudes towards nature [56]. Under the influence of environmental attitudes, each person has their own 'mental map' of what is within reach and what is appropriate for them, which ultimately influences the basis of decisions and the way they interact. Cognitive hierarchy theory [57] has been the leading social psychological theory for understanding the relationship between values and attitudes since the 1960s. It has been widely used in the emerging field of social-ecological systems (SES) [58]. According to the pyramidal cognitive hierarchy model [59,60], values predict attitudes and therefore provide an important basis for understanding, maintaining, and influencing people's attitudes towards relevant objects. Building on this theory, Kellert illustrates the coupling process between humans and nature through a new perspective on relational values under SES, explaining how and why we should consider the relationship between humans and nature as meaningful relationships and a responsibility [61]. Dunlap and Van Liere [62] studied pro-environmental behavior and the new ecological paradigm through attitudes towards the environment, and published the NEP scale to measure the overall human-environment relationship. Understanding people's psychological accessibility and preferences through attitudes to human-earth relations can also help promote environmental equity in the use of urban spaces and increase the inclusiveness of open spaces [63]. Although methods for measuring urban park accessibility have not yet been standardized and harmonized [64], it is now accepted that psychological accessibility has greater explanatory and predictive power than physical accessibility [65]. Psychological park accessibility is influenced by factors such as people's perceived attitudes, mainly from perceived distance, perceived park quality and community environment, and can be measured quantitatively or qualitatively [66]. Based on the above, the following hypothesis is proposed in this paper:

#### **H1.** *The more positive the environmental attitude, the higher the psychological accessibility.*

#### 2.2. Psychological Accessibility and Experience Quality

Effective and integrated analyses of park accessibility through psychological dimensions are currently scarce in research. Psychological accessibility is intended to be used to describe the way people perceive and evaluate the conditions around them [37]. Similar to TPB, Fishbein and Ajzen's Theory of Reasoned Action (TRA) [67] suggests that the combination of both attitudes and subjective norms determine behavioral intentions, which lead to volitional behavior. Psychological accessibility and intention can act as an internal driving process for attitudes, as a psychological variable, forming certain drives [68] and becoming a state of readiness for behavior and experience. Under the influence of psychological factors, attitudes, as well as subjective norms, can influence the quality of recreational behavior to a certain extent. For example, perceptions of running behavior can influence people's decision to participate in running activities and ultimately the quality of their running experience [69]. In terms of park use, perceived accessibility is more important than mere physical spatial accessibility. Physically accessible and high-quality parks are absolutely essential, but high-quality facilities alone are not sufficient to encourage more park use behavior. Park management should take into account the different preferences of people and their psychological perceptions of the park environment, in order to maximize park performance [70]. Psychological accessibility has also been attempted in the context of quality improvement, for example, as a reference point for the effectiveness of conservation and restoration processes [71,72]. At the same time, the psychological accessibility of transport systems, as an important part of tourism and recreational activities at destinations, is becoming an important complementary research tool when planning and assessing the quality of transport systems [73]. It also shows that affective values have a greater impact on satisfaction and behavioral intentions than other forms of value, which also provides managers with a new perspective when improving the quality of a destination [74]. Based on this, this paper proposes the following hypothesis:

#### **H2.** *The higher the psychological accessibility, the better the quality of the experience.*

#### 2.3. Psychological Accessibility and Restorative Perception of the Environmental

In addition to accessibility based on transportation (i.e., distance, time, cost), psychological accessibility of urban parks is also an important measure of residents' access to park services [75]. There is also a positive relationship between restorative environments, and human health and well-being. Although the research on restorative environments has grown significantly over the past two decades, much of the research has typically focused on environmental quality and characteristics related to restorative perceptions, neglecting the role of individual and social variables in this psychological recovery [76]. Fortunately, Urban Regeneration (Urban Renewal) [77,78] has received increasing attention from the Chinese government and has become an important driver of urbanization in China. This field emphasizes the transformation of incremental expansion of urban parks into stock renewal, emphasizing the quality of human-centered development, and focusing on social change and the psychological perception effects of human relationships [79]. Based on imagery theory and place attachment theory, Guo [80] constructed a theoretical model of the objective environment-perceived environmental sense of community-psychological well-being. The results show that the psychological factor, the perception of the built environment, and a sense of community can fully explain the relationship between residential density and subjective well-being. The positive effect of the perceived objective environment elements on well-being and resilience is verified in the context of high-density, ageing cities. Tabrizian [81], on the other hand, investigated the effect of perceived resilience and perceived security, using perceived security as a mediating effect between perceived resilience and spatial enclosure. In the current study, the role of psychological accessibility on the perception of environmental resilience is less directly analyzed, but there are studies focusing on the role of perceived psychological responses in well-being and resilience. Based on the above, this paper proposes the following hypothesis:

#### **H3.** *The higher the psychological accessibility, the higher the perception of environmental recovery.*

#### 2.4. Quality of Experience and Restorative Perception of the Environmental

Restorative environmental perception, which emphasizes the restorative nature of people's perceived environment, is increasingly being used in the assessment of the quality of urban public spaces [82]. Based on the attention restoration theory, Kaplan proposed a theory of environmental restorative perception [83]. Hartig et al. developed the first perceived restorative scale (PRS) to cover the previously mentioned dimensions of enchantment and compatibility [84]. The scale was subsequently adapted and developed by Laumann [85], Payne [86] and others [14,80,84], and is one of the hot topics in this field of research. On the other hand, other studies have explored the effects of different landscape types and different components of the same landscape [87]. On restorative effects, for example, Jeon's research [88], from the perspective of soundscapes, suggests that the design and planning of urban spaces should aim to reduce the loudness of spaces to increase revisit rates, in order to promote the recovery of the mental health of urban residents. Previous research has also looked at other intrapersonal factors, including antecedents and consequences that influence restorative effects, such as place attachment [89], environmental preference, and attitudes [90]. In the current study, the influence of the quality of experience on environmental restorative perceptions is mainly in terms satisfaction. Environmental satisfaction positively influences five dimensions of visitors' perceptions of environmental restoration. For destinations, efforts to improve visitor satisfaction, including the quality of the destination's environment, will allow visitors to experience more of the physical and mental rejuvenation potential offered by the destination. This will ultimately help the destination develop a unique competitive advantage [91]. In this regard, the following hypothesis is proposed:

# **H4.** *The higher the quality of the experience, the better the perception of the restorative nature of the environment.*

#### 2.5. Environmental Attitudes and Restorative Perception of the Environment

The cognitive hierarchy theory suggests that when external environmental conditions are adequate, the individual's capacity for autonomous development is stimulated, resulting in increased intrinsic motivation, and attitudes become critical in influencing individual behavioral choices [92]. The dimensions of fascination, compatibility, and escape in the restorative perception measure highlight the subjective attitudes of individuals in their interactions with the environment from an internal perspective [93,94]. This also implies that the stresses associated with the drudgery of everyday life are also likely to be relieved when people feel connected to a place. The factor of human-environment interaction has a more profound impact on restorative effects than the physical factor [76]. There is, therefore, a strong need to examine environmental attitudes through a human-place relationship perspective. Current research, mainly interpreted from the dimensions of place identity [89], such as place attachment and past experiences, has positively predicted restorative effects. Although place attachment is also expressed to some extent through attitudes, beliefs, preferences, feelings, values, etc. [95], research on environmental attitudes currently needs to be supplemented. Secondly, previous studies focused more on the use of 'virtual' environments for interpretation, for example, by viewing images [96] or by imagination [89] to study the relationships, and less so on real-life scenarios. Based on the above, the following hypothesis is proposed:

**H5.** *The more positive the attitude towards the environment, the better the restorative perception of the environment.* 

#### 3. Study Area and Methods

# 3.1. Study Area

The Yuelu Mountain tourist area is located in the center of the Hunan Province, China, on the west bank of the Xiangjiang River, in the famous historical and cultural city of Changsha. Relevant information is shown in Figure 1. It is mainly composed of hilly low mountains, lakes, natural flora and fauna, as well as cultural monuments, tombs of modern celebrities, and revolutionary memorial sites, etc. It receives more than 3 million visitors annually and has now become a 5A-class key scenic spot and a civilized model tourist destination in China. From the perspective of China's classification of urban parks, Mount Yuelu belongs to the category of scenic parks. It also has the distinctive characteristics of a forest park with its wealth of species. Most of these scenic parks have a high concentration of green areas and a certain landscape appeal, and people are generally willing to spend more time and effort to reach these parks [97]. The distribution of population density and green space in Changsha is shown in Figures 2 and 3. Yuelu Mountain is an important part of Changsha's urban green space system. As a green space close to a densely populated center, it is fully equipped with the recreational functions of an urban forest park. Almost everyone in the city center has relatively easy access to Yuelu Mountain for recreational activities. Yuelu Mountain, as an ecotourism destination in Changsha, is also one of the key sources of health and leisure and high well-being for Changsha citizens, making it a good study site for this research.

Based on literature review of studies that examined the relationships among environmental attitude, psychological accessibility, quality of experience, and environmental restorative perceptions, a model diagram of the effect of environmental restorative perception mechanism was constructed, and the relevant research hypotheses and design of the initial measurement items for this study were developed. Please refer to Appendix A for details.



Figure 1. Location of Yuelu Mountain Scenic Area.



Figure 2. Overview of the urban area of Changsha City.

#### 3.2. Questionnaire Design

In this paper, environmental attitudes were measured using the NEP (New Environmental Paradigm) scale [98], a scale that is recognized in the field of environmental psychology, comprising of six questions. Mental accessibility was measured using the summary and recommendations of Keunhyun [66] in his article, which includes six questions covering two dimensions: perception of quality and perception of the surrounding environment. Quality of the experience was measured based on Myunghwa [99], which includes three dimensions: learning, enjoyment, and escape [100], covering nine questions. Environmental restorative perceptions were measured on the basis of Kaplan's theoretical scale [101] encompassing four dimensions: distance, fascination, extent, and compatibility, with 12 questions.



Figure 3. The population density of the urban area.

This study combines the theory of environmental restorability with psychological accessibility, and constructs a conceptual model (see Figure 4) of the pathway of environmental restorability action under the influence of psychological accessibility by referring to the relevant results of other studies.



**Figure 4.** Model diagram of restorative perception of the environment pathways under the influence of psychological accessibility.

#### 3.3. Data Collection

The data were collected from the Yuelu Mountain Scenic Area, an AAAAA (the highest rating) national tourist destination in Changsha, Hunan Province, China. A survey of recreationists was conducted from 8 to 14 December 2022, using convenience sampling. By taking into account the activity patterns and preferences of recreationists in the Yuelu Mountain scenic area, most of the data collection took place between 10 a.m. and 5 p.m. in areas with good landscape resources and a high concentration of recreationists. A total of 420 questionnaires were distributed. After screening omissions and identical responses, 404 valid samples were collected, which is about 96.1% sample return rate. Demographic distributions of respondents are presented in Table 1. Of the 404 respondents, 59.7% were male and 40.3% were female. In terms of age, majority belong to the 18-to-30-year category, accounting for 40.3% of the total respondents. Employees and students account for 64.6% of the total number of respondents. About 84.1% of the respondents had a college or university degree, or above. A total of 81.4% of the respondents had a per capita monthly household income of RMB 2000 or more.

Indicator Item		Frequency	%
	Female	163	40.3
Sex	Male	241	59.7
	Under 18	14	3.5
	18–30	163	40.3
1 00	31–40	105	26.0
Age	41–50	63	15.6
	51-60	50	12.4
	60 above	9	2.2
	Students	158	39.1
	Civil Servants	13	3.2
	Freelancers	24	5.9
Job	Teachers	53	13.1
	Office workers	103	25.5
	Private owners	31	7.7
	Retired	1	2
	Other	21	5.2
	Under 1000	18	4.5
M (1.1	1001-2000	39	9.7
Monthly per capita	2001-5000	104	25.7
nousenoia income	5001-10,000	145	35.9
	10,000 above	98	24.3
	Junior Secondary and below	16	4.0
Education	High School and Secondary School	32	7.9
	College and Undergraduate	236	58.4
	Postgraduate and above	120	29.7

Table 1. Descriptive statistical results.

## 3.4. Data Analysis

This paper employed the SPSS 19.0, SPSSAU23.0, and Amos 24.0 statistical software to empirically test the theoretical model. Firstly, this study imported the validated questionnaire data into IBM SPSS Statistics for Windows, version 19.0 (IBMCorp., Armonk, NY, USA) to verify the internal consistency of the dimensions, to examine the stability of the questionnaire scale, and to conduct an exploratory factor analysis. Secondly, this study used IBM SPSS AMOS Graphics for Windows, version 24.0 (IBMCorp., Armonk, NY, USA) to conduct confirmatory factor analysis (CFA) on the variables involved in the measurement

model, to examine the stability of the questionnaire scale. CFA was conducted to examine the covariate validity (including convergent and discriminant validity) and other validity analyses of the measurement model. Finally, mediation analysis was conducted with the help of SPSSAU. Structural equation modeling (SEM) was conducted to empirically test the path relationships between variables in the theoretical model, to explore the mechanisms influencing the effects of environmental resilience and psychological accessibility.

#### 4. Results

#### 4.1. Reliability Analysis

Exploratory factor analysis (EFA) was applied to the whole sample to check the reliability of the sample. The overall reliability of the scale was 0.964, indicating good reliability of the scale; the KMO value of the scale was 0.946, which met the basic requirement of 0.8 or above [102]; and Bartlett's spherical test also reached a significant level, indicating the validity of the data for factor analysis. These are shown in Table 2, below.

Table 2. Reliability and validity test.

Cronbach's Alpha	КМО	Bartlett's Test of Spherical	Df	Sig.
0.963	0.949	13,109.480	528	0

To better interpret the factor loading matrix, principal component factor analysis was used in this study. Factor attribution for each scale can be determined from the rotated component matrix. The factor loadings were all greater than 0.6. The attribution factors were named as different dimensions of the variables depending on the content of the topic. These factors are presented in Tables 3–6.

Table 3. Rotating component matrix of the environment attitude.

Items		Factor Loading	
	Balance of Nature	Limits to Growth	Human Right
EA1	0.784		
EA2	0.821		
EA3			0.852
EA4			0.676
EA5		0.774	
EA6		0.791	

 Table 4. Rotating component matrix of the restorative perception of the environment.

Items		Factor I	Loading	
	Compatibility	Being away	Fascination	Extent
RP1		0.796		
RP2		0.651		
RP3		0.758		
RP4			0.683	
RP5			0.758	
RP6			0.614	
RP7				0.631
RP8				0.697
RP9				0.745
RP10	0.788			
RP11	0.701			
PE12	0.799			

Items		Factor Loading	
	Learning	Enjoyment	Escape
EQ1	0.885		
EQ2	0.802		
EQ3	0.819		
EQ4			0.809
EQ5			0.902
EQ6			0.768
EQ7		0.764	
EQ8		0.898	
EQ9		0.823	

Table 5. Rotating component matrix of the experience quality.

Table 6. Rotating component matrix of psychological accessibility.

Items	Factor Loading		
	Perceived Neighborhood Environment	Perceived Park Quality	
PA1		0.883	
PA2		0.795	
PA3		0.647	
PA4	0.859		
PA5	0.802		
PA6	0.815		

#### 4.2. Common Method Variance Test

Since this study used the questionnaire method to obtain research data, in which the same subject always provides the survey information, even though the questionnaire is filled out anonymously, it does not meet the standard requirement of controlling common method bias (CMB) [103]. Thus, the data should first be tested for common method bias. The Harman one-way test was used, i.e., all questions were analyzed by unrotated factor analysis and if no single factor explained most of the variance, then no serious common method bias was found to exist. The first principal component explained 32.3% of the variance, which is less than half of the total variance explained (75%). It is therefore concluded that the common method bias is not significant in this paper.

#### 4.3. Validity Analysis

The Cronbach's alpha coefficients for the variables in the theoretical model were calculated using the SPSS 19.0 software. The results showed that the Cronbach's alpha coefficients for the latent variables were all above 0.7, indicating that the questionnaire had good reliability, meeting the prerequisite for validity analysis. A validation factor analysis was then conducted on the sample data using the Amos 21.0 software, using the maximum likelihood estimation method (Table 7). The results showed that the composite reliability (CR) of all variables was also above 0.7, further validating the internal consistency and stability of the variables measured in the questionnaire. The validity of the questionnaire was measured in three areas, namely content validity, construct validity and conjoint validity [54].

#### 4.3.1. Content Validity

In the design of the questionnaire, the questions for each variable were derived from well-established scales in the literature, which ensured that the questionnaire had good content validity.

$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Factor	Items	Path	Estimate	α	AVE	CR
		Palance of nature	EA1	0.87			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Datatice of flature	EA2	0.852		0 7801	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Environment attitude	Limits to growth	EA3	0.803	0.856		0.055
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Environment attitude	Linus to growth	EA4	0.858	0.830	0.7601	0.955
		Human rights	EA5	0.964			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		i funtari figitto	EA6	0.942			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			EQ1	0.758			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Learning	EQ2	0.76			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			EQ3	0.748			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			EQ4	0.74			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Experience quality	Enjoyment	EQ5	0.709	0.851	0.5717	0.9231
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			EQ6	0.74			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			EQ7	0.803			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Escape	EQ8	0.758			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			EQ9	0.785			
$ \begin{array}{cccc} & & & & & & & & & & & & & & & & & $			PA1	0.737			
Psychological accessibility       PA3       0.829       0.901       0.6461       0.9162         Perceived neighborhood environment       PA4       0.816       0.901       0.6461       0.9162         Perceived neighborhood environment       PA6       0.818       0.824       0.901       0.6461       0.9162         Restorative perception of the environment       Being away       RP2       0.833       0.837       0.837         Restorative perception of the environment       Fascination       RP5       0.833       0.950       0.6858       0.9632         Extent       RP8       0.842       RP9       0.796       0.910       0.857       0.950       0.6858       0.9632         Compatibility       RP11       0.836       RP12       0.817       0.950       0.6858       0.9632		Perceived park quality	PA2	0.774			
accessibility         Perceived neighborhood environment         PA4         0.816         0.901         0.6461         0.9162           Perceived neighborhood environment         PA5         0.818         PA6         0.844         0.9162           Restorative perception of the environment         Being away         RP1         0.783         0.837         0.837           Restorative perception of the environment         Fascination         RP5         0.833         0.950         0.6858         0.9632           Extent         RP8         0.842         0.950         0.6858         0.9632           RP10         0.857         RP10         0.857         0.9162         0.9162           Compatibility         RP11         0.836         0.9632         0.9632	Psychological		PA3	0.829	0.901	0 ( ) ( )	0.01/0
Perceived neighborhood environment         PA5         0.818           PA6         0.844           RP1         0.783           Being away         RP2         0.833           RP3         0.837           RP4         0.819           Fascination         RP5         0.833           RP6         0.817         0.950         0.6858         0.9632           of the environment         RP7         0.864         0.950         0.6858         0.9632           Extent         RP8         0.842         0.950         0.6858         0.9632           Extent         RP8         0.842         0.950         0.6858         0.9632           Compatibility         RP11         0.836         RP10         0.857           Compatibility         RP11         0.836         RP12         0.817	accessibility		PA4	0.816		0.6461	0.9162
environment         PA6         0.844           RP1         0.783           Being away         RP2         0.833           RP3         0.837           RP4         0.819           Fascination         RP5         0.833           RP6         0.817         0.950         0.6858         0.9632           of the environment         RP7         0.864         0.950         0.6858         0.9632           Extent         RP8         0.842         0.950         0.6858         0.9632           Extent         RP8         0.842         0.950         0.6858         0.9632           Compatibility         RP10         0.857         0.864         0.950         0.6858         0.9632	-	Perceived neighborhood	PA5	0.818			
RP1         0.783           Being away         RP2         0.833           RP3         0.837           RP4         0.819           Fascination         RP5         0.833           Restorative perception         RP6         0.817           of the environment         RP7         0.864         0.950         0.6858         0.9632           Extent         RP8         0.842         RP9         0.796           RP10         0.857         RP10         0.857           Compatibility         RP11         0.836         RP12         0.817		environment	PA6	0.844			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			RP1	0.783			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Being away	RP2	0.833			
Fascination       RP4       0.819         Restorative perception       RP6       0.833         of the environment       RP7       0.864       0.950       0.6858       0.9632         Extent       RP8       0.842       RP9       0.796         RP10       0.857       RP11       0.836         RP12       0.817       0.817		0,	RP3	0.837			
Fascination       RP5       0.833         Restorative perception       RP6       0.817         of the environment       RP7       0.864       0.950       0.6858       0.9632         Extent       RP8       0.842       100       0.857       100       100       100         Compatibility       RP11       0.836       100       100       100       100         RP12       0.817       100       100       100       100       100       100			RP4	0.819			
Restorative perception       RP6       0.817         of the environment       RP7       0.864       0.950       0.6858       0.9632         Extent       RP8       0.842       RP9       0.796       10000       1000       1000       <		Fascination	RP5	0.833			
of the environment     RP7     0.864     0.950     0.6858     0.9632       Extent     RP8     0.842       RP9     0.796       RP10     0.857       Compatibility     RP11     0.836       RP12     0.817	Restorative perception		RP6	0.817		0.4050	0.0400
Extent RP8 0.842 RP9 0.796 RP10 0.857 Compatibility RP11 0.836 RP12 0.817	of the environment		RP7	0.864	0.950	0.6858	0.9632
RP9     0.796       RP10     0.857       Compatibility     RP11     0.836       RP12     0.817		Extent	RP8	0.842			
RP10       0.857         Compatibility       RP11       0.836         RP12       0.817			RP9	0.796			
Compatibility RP11 0.836 RP12 0.817			RP10	0.857			
RP12 0.817		Compatibility	RP11	0.836			
		1 2	RP12	0.817			

Table 7. Results of the validation factor analysis.

#### 4.3.2. Construct Validity

Construct validity refers to the extent to which the content of a questionnaire scale can measure theoretical abstractions and their ability to do so. It is usually determined by the contribution of the variance of the first principal component of each latent variable. The results show that the contribution of the first principal component of environmental attitudes, psychological accessibility, quality of experience, and perception of restorative environment are 82.1%, 70.5%, 62.1%, and 71.2%, respectively. Generally, a requirement of greater than 40% is acceptable [104]. Since the questionnaire scale's measurement items have a greater contribution to the corresponding latent variables, the construct validity of the volume scale is good.

### 4.3.3. Convergent Validity

Convergent validity is a test of the convergent and discriminant validity of a questionnaire scale. Convergent validity is tested by the standardized loadings of each latent variable measure and its average variance extracted (EA) [105]. Discriminant validity was determined by comparing the square root of the average variance extracted from the latent variables with the absolute value of the correlation coefficients between the variables. If the former was greater than the latter, it indicates good discriminant validity between the variables. Table 7 shows that the AVE values for the latent variables were greater than 0.5 and the composite reliability (CR) was greater than 0.7. The results indicate that the measurement items explained most of the variance in the latent variables, indicating that the questionnaire had good convergent validity.

Table 8 shows the results for discriminant validity, with all variables being significantly related. There were significant correlations among psychological accessibility, and the quality of experience and restorative effects on environmental attitudes. There was a significant positive relationship between psychological accessibility, and the quality of experience and perception of environmental restoration. The results of this correlation analysis also provide evidence for the pathway model proposed for this study.

Table 8. Results of correlation analysis.

	AVE	EA	PA	RP	EQ	
EA	0.780	0.883				
PA	0.646	0.383 ***	0.804			
RP	0.686	0.196 ***	0.619 ***	0.828		
EQ	0.572	0.189 ***	0.606 ***	0.863 ***	0.756	
Note 1. *** magazie +	1 < 0.001					_

Note 1: \*\*\* means *p* < 0.001

#### 4.4. Structural Equation Model Analysis

### 4.4.1. Structural Equation Model Fitting

The fit of the structural equation model was determined using absolute and relative fit indices, such as  $\chi^2$ /df, CFI, NFI, and RMSEA [106]. Based on the above criteria, if the fitted parameters are within the accepted range, the structural equation model is a good fit. After testing the reliability, validity and correlation coefficients of the measured model, the structural equation model with theoretical assumptions, was fitted to the data and the path analysis was carried out using maximum likelihood estimation method. More standard scales were used in the study and the results indicated that the model fitted well. The results are presented in Table 9.

Table 9. Test of the degree of fit of the structural equation model.

CMIN/DF	RMSEA	CFI	IFI	TLI	NFI
2.701	0.065	0.937	0.937	0.931	0.904

Note 1: CMIN/DF means chi square; RMSEA means root-mean-square error of approximation; CFI means comparative fit index; IFI means incremental fit index; TLI means Tucker-Lewis index; NFI means Normed Fit Index.

#### 4.4.2. Path Analysis

To explore the pathways between environmental attitudes, psychological accessibility, quality of experience, and perceptions of environmental resilience, a structural equation modeling analysis was conducted on the structural model. The results of the fit of the structural equation model showed that:  $\chi^2/df = 2.701$ , CFI = 0.937, IFI = 0.937, TLI = 0.931, NFI = 0.904, and RMESA = 0.065. The fit indexes met the recommended values in terms of statistical significance, i.e., the structural model fit the sample data well.

Based on the results of the hypothesis test (Table 10), the standardized path coefficient was 0.392 > 0 for the effect of environmental attitudes on psychological attainability, and this path showed a significance, at the 0.001 level (CR = 7.642, p = 0.000 < 0.001), indicating that environmental attitudes have a significant positive effect on psychological attainability, supporting H1. The standardized path coefficient value of 0.655 > 0 was found to be significant at the 0.001 level (CR = 11.074, p = 0.000 < 0.001) for the effect of mental accessibility on the quality of experience, indicating that mental accessibility has a significant positive effect on the quality of experience, supporting H2. The path coefficient of psychological accessibility to restorative perception of the environment was 0.084, which was significant at the 0.05 level (CR = 2.067 p = 0.039 < 0.05), indicating that psychological accessibility has a positive impact on the perception of environmental restoration, validating H3. The

standardized path coefficient value is 0.887 > 0 for the impact of the experience quality on restorative perception of the environment with a significant level of 0.001 (CR = 15.074, p = 0.000 < 0.001), indicating that quality of experience, will have a significant positive impact on environmental restoration, validating H4. The path coefficient was -0.018 for the impact of environmental attitudes on environmental restoration and the *p*-value did not show significance (CR = -0.669, p = 0.503 > 0.05), indicating that environmental attitudes do not have a direct and significant impact on environmental restorative effects, rejecting H5.

	Estimate	S.E.	C.R.	p	Result
EA→PA	0.392	0.039	7.542	***	Y
$PA \rightarrow EQ$	0.665	0.098	11.074	***	Y
PA→RP	0.084	0.058	2.067	**	Y
$EQ \rightarrow RP$	0.887	0.051	15.074	***	Y
$EA \rightarrow RP$	-0.018	0.029	-0.669	0.503	Ν

Table 10. Test of the degree of fit of the structural equation model.

Note 1: Y indicates support; N indicates no support. \*\*\* means p < 0.001, \*\* means p < 0.01.

#### 4.4.3. Mediation Analysis

As Figure 5 shows, restorative perception of the environment is directly influenced by the experience quality, which is directly influenced by psychological accessibility, and ultimately psychological accessibility acquired from environmental attitudes. This suggests that there is a mediating effect in the model regarding the mechanisms influencing the effect of environmental restorative perceptions under psychological accessibility. To test the mediating relationship within the model, Bootstrap sampling tests were conducted on the indirect effect values and bootstrap analyses were conducted to verify the presence of a mediating effect [107]. The effect analysis process is summarized in Table 11. Table 11 shows that the total effect of environmental attitudes on perceptions of environmental resilience was significant. The indirect effects through psychological accessibility and the quality of experience were all significant. However, the direct effect of environmental attitudes on perceptions of environmental resilience was not significant, which formally mediates the full effect of psychological accessibility on the perceptions of environmental resilience, and explains the hypothesis test that the direct effect of H5 environmental attitudes on perceptions of environmental resilience was not significant. The reason for this is that the direct effect of environmental attitudes on perceptions of environmental resilience was not significant in the hypothesis test. The results in Table 12 show that two types of mediating effects are included, parallel mediation and chain mediation. For the mediation pathway 'EA $\Rightarrow$ PA $\Rightarrow$ PR', the 95% interval does not include the number 0 (95% CI: 0.026–0.100), thus indicating the existence of this mediation effect pathway. For the mediation path 'EA $\Rightarrow$ EXQ $\Rightarrow$ PR', the 95% interval includes the number 0 (95% CI:  $-0.106\sim0.030$ ), thus indicating that this mediation path does not exist. Next, for the chain-mediated pathway, the 95% interval for the mediated pathway, 'EA $\Rightarrow$ PA $\Rightarrow$ EXQ $\Rightarrow$ PR', did not include the number 0 (95% CI: 0.124–0.253), thus suggesting that this mediated pathway exists. It follows that psychological accessibility and quality of experience fully mediates the effect of environmental restorative perceptions, with no significant mediating effect of the quality of experience. Specifically, environmental attitudes indirectly influenced environmental restorative perceptions through psychological accessibility (fully mediated = 0.210, p < 0.001).



**Figure 5.** Path analysis results. Note 1: \*\*\* means p < 0.001, \*\* means p < 0.01.

Effect Type	Path	Effect	S.E.	t	р	LLCI	ULCI
Direct effect	EA⇒RP	-0.01	0.03	-0.32	0.749	-0.069	0.05
	EA⇒PA	0.361	0.044	8.276	0.000	0.276	0.447
To diamat	EA⇒EQ	-0.056	0.047	-1.184	0.237	-0.148	0.037
Indirect	PA⇒EQ	0.726	0.050	14.537	0.000	0.628	0.824
effect	PA⇒RP	0.188	0.040	4.714	0.000	0.110	0.266
	EQ⇒PR	0.803	0.032	24.836	0.000	0.740	0.866
Total effect	EA⇒PR	0.224	0.056	3.998	0.000	0.114	0.334

PS: LLCI refers to the lower limit of the 95% interval of the estimate; ULCI refers to the upper limit of the 95% interval of the estimate.

Table 12. Results of indirect effects analysis.

Path	Effect	Boot SE	BootLLCI	BootULCI	Z	р
EA⇒PA⇒PR	0.068	0.019	0.027	0.101	3.610	0.000
EA⇒EXQ⇒PR	-0.045	0.035	-0.107	0.029	-1.283	0.2
EA⇒PA⇒EXQ⇒PR	0.210	0.034	0.122	0.252	6.248	0.000

Note 1: *z* represents the statistic in the sobel analysis and represents the distance between the raw score and the parent mean

#### 5. Discussion

This study seeks to uncover the pathways and mechanisms by which psychological accessibility affects environmental restorability. To this end, a model of environmental resilience under the influence of psychological accessibility is constructed. It specifically looks at environmental attitudes, quality of experience, and other relevant factors. This study contributes to the development of tourism-management literature related to the psychological accessibility of urban green spaces, and the findings support the study's key hypothesis, implying that visitors' psychological accessibility and quality of experience influence the effects of environmental restorability in urban green spaces. These findings also support the studies by Park [66], Liu [96], and Oriade [74]. More positive environmental attitudes are more likely to have higher psychological accessibility studies in China have mainly focused on transportation factors, such as calculation of shortest paths and evaluation of road network structures, this study strengthens the application and focus of accessibility between urban planning and social sciences by correlating psychological accessibility accessibility and focus of accessibility between urban planning and social sciences by correlating psychological accessibility and focus of accessibility between urban planning and social sciences by correlating psychological accessibility accessibility between urban planning and social sciences by correlating psychological accessibility accessibility and focus of accessibility between urban planning and social sciences by correlating psychological accessibility accessibility accessibility accessibility between urban planning and social sciences by correlating psychological accessibility accessibility accessibility accessibility accessibility between urban planning and social sciences by correlating psychological accessibility accessibility

cessibility with perceptions of environmental restorability, including psychological, human and social non-transportation factors. Subsequently, practical suggestions and implications for the planning, design, and management of urban green spaces are presented.

According to the results of the data analysis, environmental attitudes, psychological accessibility, environmental quality, and perception of environmental resilience all have an impact, but environmental attitudes do not directly influence the perception of environmental resilience, but rather through psychological accessibility and experience quality. The following hypotheses were verified through the empirical analysis conducted in this study: the more positive the environmental attitude, the higher the psychological accessibility; the higher the psychological accessibility, the better the quality of the experience; the higher experience quality, the better the restorative perception of the environment, thus, the "environmental attitude—psychological accessibility—quality of experience—restorative perception of the environment" chain mediation pathway was verified. In addition, the full mediating effect of psychological accessibility and experience quality on restorative perception of the environment was also verified. This conceptual model leads to a pathway for environmental restorative perceptions in terms of psychological accessibility.

Environmental attitudes have a significant positive effect on psychological accessibility, in contrast to people's perceptions of human rights, which has a greater effect on their environmental resilience. Each person has a different perception of nature, which is often used as a basis for action or inaction. We need to explore what urban green space really means to people through a better understanding of the relationship between humans and nature. By better understanding people's psychological willingness to participate in green recreation activities, we can value the influence of psychological awareness on decision-making and management. This also validates Kellert's [108] view, stating that understanding how people perceive and experience the beauty of all landscapes is crucial to gaining public support and compliance with ecologically motivated landscape change. Effective management needs to be tailored to people's real needs and interactions so that more people, including disadvantaged groups, can share the benefits of the environment, as well as providing a basis for planning and managing the construction and regeneration of green spaces in the areas surrounding urban parks [109]. Understanding people's perceived attitudes and improving their psychological accessibility is important to help maximize the "best use of things".

It is undeniable that accessibility has a direct impact on the performance of urban green spaces and the quality of people's experience. In this study, all dimensions of psychological accessibility had a significant positive impact on the quality of experience. Urban green spaces not only provide a comfortable and pleasant urban environment for citizens, but also provide an important input for the sustainable and healthy development of urban life. In addition to improving the physical environment of the space through physical means, more attention should be paid to stimulating the spatial vitality of an area, in order to improve psychological accessibility and the sense of place and attachment to the destination. This will contribute to increasing the effectiveness of learning, enjoyment, and temporary escape from the pressures of real life. On the basis of relevant policies, regulations and plans, the public is provided with a "bottom-up" platform [110] to carry out interactive activities that deepen and improve the quality of experience and reflect the initiative of the public, making urban green spaces more functional and inviting to users.

The learning, enjoyment, and escape dimensions of the experience quality have a significant positive impact on being away, fascination, extent and compatibility in environmental restorative perceptions, i.e., higher experience quality helps people obtain better environmental restorative perceptions. According to attention restoration theory [83], exposure to the outdoor environment is conducive to positive emotions and the restorative environment, psychological recovery is not only related to the physical environment, but also to the interaction between the individual and the environment [10]. It is easy to understand that the better the quality of the experience provided by an urban green space, the

more the user feels a sense of freedom from the daily routine. The more they perceive the enchantment of the environment, the more the inclusion in the environment is conducive to the physical and psychological recovery of the visitor, the natural recovery of directed attention, and the acquisition of positive emotions [111].

This paper finds that environmental attitudes do not directly influence the level of restorative perception, but must act through mediators, i.e., through psychological accessibility, and experience quality to ultimately influence the effect of restorative perception, which contradicts hypothesis H5. In fact, numerous factors have the potential to influence the quality of park use, and research on the relative importance of several of these factors remains somewhat inconsistent. In addition, there is a lack of widely adopted, integrated conceptual models and tools to model park use. This can be explained through a number of reasons. First, the NEP scale has been developed for a long time, and domestic scholars' research on the reliability and validity of the NEP scale is basically the same as that of foreign studies, all agreeing that the NEP scale has good reliability and validity [59], but there is still no agreement on the dimensions of the scale. Although there is no essential difference between scales with different numbers of questions, they can be tailored according to the study area [112,113] and research object [114,115], on the basis of ensuring the reliability and validity of the scale. However, it is indisputable that this situation may also affect the results of the empirical study to a certain extent. Second, while environmental attitudes focus more on the antecedents of psychological pathways, the effects of environmental restorative perceptions focus more on the effects after the implementation of driving mechanisms, so the influence of intermediate links cannot be ignored. The theory of planned behavior [45], one of the leading behavioral theories in psychology, also indicates that cognitive structures (e.g., attitudes, beliefs, norms, and values) are good predictors of behavioral intentions, but there are many barriers between behavioral intentions and actual behavior. That is, attitudes largely and directly influence decision-making behavior, but may not directly influence the strength or weakness of the effects ultimately obtained.

The satisfactory fit between the model and the sample data in this study suggests that the model is applicable and effective in explaining and predicting people's park use needs and behaviors. The relationship between people's psychological perceptions and effectiveness is explained to a certain extent on the basis of the theory of planned behavior and the influencing factors investigated. Thus, our findings test the hypothesis that if a person has a positive attitude towards the environment and faces a better psychological accessibility to a destination, they are more likely to have the intention to visit the park for a recreational experience and obtain a higher environmental restorative effect. The results suggest that psychological accessibility is related to the perception of environmental restoratives, which is a new development, since existing theoretical perspectives on restorative environments prioritize bottom-up perceptual processing over general associations. Indeed, this finding is not without precedent, as researchers such as Lättman [73], Wan [116] and Nursyamsiah [117], have hypothesized that psychologically generated accessibility, associations, and connections to a place may play a role in restorative perception. In addition to suggesting a greater role for psychological accessibility in theoretical models of restorative environments, these findings also have implications in the planning and management of urban green spaces.

In conclusion, these findings provide an exciting platform for further research into how individual psychological dimensions can enhance psychological restoration on-site. This suggests the importance of theoretical and practical applications of the study, to some extent guiding the way to improving the performance of green-space use.

#### 6. Conclusions, Recommendations, and Study Limitations

# 6.1. Conclusions

Taking the Yuelu Mountain scenic area as an example, this paper constructs a research model that includes environmental attitudes, psychological accessibility, quality of experience, and perceptions of environmental restoration. The overall model shows that environmental attitudes have a significant positive influence on the perception of environmental restorability through psychological accessibility and the quality of experience. Although the psychological accessibility of urban green spaces has had an extensive presence in behavioral research in previous decades, less research has been conducted on its effect on the perceived effectiveness of environmental resilience. Based on the findings, the following conclusions can be drawn:

- (1) People's different attitudes toward the environment influence the level of psychological accessibility and quality of experience: the more positive the attitude toward the environment, the higher the psychological accessibility and the higher the quality of experience.
- (2) The level of psychological accessibility not only directly influences the impact of environmental restorative effects, but also forms a path with the quality of experience to jointly influence the effect of environmental restorative perceptions. The higher the psychological accessibility, the higher the effect of environmental restorative effects. The higher the psychological accessibility, the better the environmental restorative effect.

In summary, the findings of this paper provide a more comprehensive description of the psychological accessibility and quality of experience generated by visitors in urban green spaces, as well as the pathways that influence the perceived effects of environmental restorative perceptions. The complex pathway of "environmental attitudes  $\rightarrow$  environmental restorative perceptions", and its influencing mechanisms were explored.

#### 6.2. Recommendations

The above findings provide fundamental insights to guide managers in the effective design and management of urban green spaces, helping visitors achieve a high quality of experience and high environmental restorative effects. Specifically, this can be done in the following ways:

- (1) Enhance environmental awareness and enrich interactive activities. People's environmental attitudes and environmental awareness should be linked, so the spread of environmental knowledge will affect the quality of the experience to a certain extent, which further indirectly affects the high level of environmental restorative effects of visitors. Studies have shown that incorporating environmental issues into education and training curricula has been effective in developing environmental awareness among students. Similarly, urban green spaces can organically combine environmental knowledge with higher quality recreational experiences. For example, administrators can provide nature education in urban green spaces, such as urban forest parks, and join forces with universities and institutions to give presentations and hold open days for interactive experiences in order to improve environmental literacy learning. Increasing good social interaction can enhance people's interest in and identification with the region, and reduce the psychological barriers to ecotourism.
- (2) Reinforcing the combined effectiveness of economic benefits and public participation and focusing on market demand. Considering the positive influence and moderating effect played by psychological accessibility, as a service-oriented subject, urban parks should enrich park features and functions as much as possible to meet multi-level market demands. This includes expanding the leisure and experience functions of forests and creating recreation specialized groups by strengthening social activities in forests, and continuously strengthening the construction of information platforms for social opinion and media propaganda to unblock information interaction channels for recreationists. Pilot studies of PPGIS (Public Participatory Geographic Information System) can be carried out in conjunction with traditional tools, such as GIS, to enhance attention to public psychology, achieve reasonable feedback with public participation, and apply it to urban park evaluation and planning. The process of planning and management should be based more on the perspective of the recreationists.

(3) Improve infrastructure and enrich tourism products. This is needed in order to stimulate restoration pathways under the chain of "environmental attitude—psychological accessibility—experience quality—restoration perception of the environment", and to achieve restoration effects. Park managers can first improve the infrastructure of urban forest parks, enhance the level of service, build and renovate public facilities for accessibility, as well as improve the convenience and safety of the experience of recreationists, in order to stimulate their motivation to visit. In addition, through creating environmentally friendly and ecological tourism products, the park managers can encourage a comfortable and pleasant state of mind for visitors, and immerse the visitors in the ecotourism experience.

In summary, urban park managers, businesses or communities cannot limit themselves to improving a single element of physical space to enhance the quality of visitor experience; they can choose different paths to effectively promote the quality of visitor experience and environmental restorative effects, depending on their specific situation, and delving into the psychology and environmental attitudes of tourists.

#### 6.3. Study Limitations

This study verified the effects of visitors' environmental attitudes and psychological accessibility on the perceived effectiveness of environmental restorative effects. Due to the research funding, time, and effort constraints, several current limitations provide perspectives for future research, including the following three points:

- (1) As domestic research on psychological accessibility exists mainly at the macro level, the scales in this study are drawn from foreign literature and therefore inevitably suffer from the following problems in terms of scope of use. The complex and subtle Chinese–English translation issues that may lead to differences in the understanding of the question items, and coupled with the influence of cultural differences between China and abroad, this creates an urgent need for more localized research to accommodate the measurement of Chinese tourists. Therefore, although the data in this paper are compliant and good, there is still room for improvement.
- (2) Although the Yuelu Mountain scenic area is popular, easily accessible and representative and typical of the case site area, and even of urban forest parks in China, there are limitations in the scope of the data sample for this study. At the same time, the recovered sample data remain somewhat uneven in terms of demographic distribution. Due to recreational preferences and topographical factors, there are fewer visitors of higher age groups in this area, with middle-aged and younger visitors being more typical. This is also true for other demographic factors, such as occupation, education level, and economic ability, as well as analysis of visitor behavior patterns within different seasons and environments. Future research could address this issue by increasing the number of samples and cases, and by planning the research program methodology more scientifically.
- (3) In terms of measuring the effects of psychological accessibility and environmental restorative perceptions, it is hoped that in the future, more studies can be conducted measuring people's inner perceptions through a combination of more specific experiments and data, and better qualitative and quantitative research methods. The scope and methodology of this study can therefore be further expanded and enriched.

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**Data Availability Statement:** The data presented in this study are available in the Appendix A. Informed consent was obtained from all subjects involved in the study.

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Conflicts of Interest: The authors declare no conflict of interest.

#### Appendix A

A survey on perceived psychological accessibility and environmental restoration in urban forest parks:

Dear Friend,

Hello! This is a questionnaire on the perception of psychological accessibility and environmental restoration in urban forest parks. The questionnaire consists of two sides and five sections: demographic background, attitude towards environmental concern, psychological accessibility, quality of experience, and perception of environmental restoration. Please tick the relevant boxes in the questionnaire as appropriate. All the information you fill in will be kept completely confidential and the data will be used for academic research only. It is expected to take 5 min of your time, and we thank you for your active support and patient participation!

Part 1: Demographic background (please tick the corresponding box)

- 1. Your gender:  $\Box$ Female  $\Box$ Male
- 2. Your age: □Under 18 years old □18–25 years old □26–30 years old □31–40 years old □41–50 years old □51–60 years old □60+ years old
- 3. Your level of education: □Junior high school and below □High school and secondary school □College and undergraduate □Postgraduate and above
- 4. Your occupation: □Student □Civil servant □Freelancer □Teacher □Unit employee □Private owner □Retired person □Other
- 5. Your monthly household income per capita: (Unit: RMB) □1000 and below □1001–2000 □2001–5000 □5001–10,000 □10,000 and above

Part 2: Attitudes towards environmental concern, quality of experience, mental accessibility, perception of environmental resilience scales (please tick the appropriate number).

Scale		Question		
	Balanca of natura	EA1		
Environment attitude	balance of nature	EA2	The balance of nature is fragile and can be easily upset	
	Limits to growth Human rights	EA3	The Earth is like a spaceship with very limited space and resources	
		EA4	The nature's ability to balance itself is strong enough to cope with the impact of the modern industrial society	
		EA5	Plants and animals have the same right to live as humans	
	C C	EA6	Despite their special abilities, humans are still governed by the laws of nature	

Sc	ale	Question		
	Looming	EQ1	I gained information and knowledge about the Urban Forest Park	
Experience quality	Learning	EQ2	I have gained a new understanding of Mount Yuelu through this experience	
		EQ3	The recreation experience has enhanced one of my abilities (motor skills, self-regulation, flora and fauna awareness, etc.)	
		EQ4	I felt very happy	
	Enjoyment	EQ5	I liked being in the forest park, it made me feel relaxed and it was enjoyable	
		EQ6 EQ7	I got a lot of fun out of the recreation experience I felt like I was in another world	
	Escape	EQ8	I felt like I had escaped from all the realities of my life	
Psychological accessibility		EQ9	I was very involved in the recreation activities and I felt like I forgot about myself	
	Perceived park quality	PA1	It has a good infrastructure (lighting, toilets, walking paths, activity equipment, etc.)	
		PA2	It provides a place for me to socialize and interact with friends and relatives	
		PA3	There is a good maintenance system (security, hygiene, etc.)	
	Perceived neighborhood environment	PA4	The area has an adequate amount of urban green space	
		PA5	The neighborhood has an abundance of urban amenities for all kinds of travel needs	
		PA6	The neighborhood is clean, beautiful and harmonious	
		RP1	It's a break from my daily routine	
	Being away	RP2	I see it as a place where I can completely relax	
		RP3	It gives me a sense of being free from the constraints of the mundane world	
	Fascination	RP4	There is so much to explore and discover here	
Restorative perception of		RP5	It arouses my curiosity	
the environment		RP6	There is a charm that makes me want to spend more time here	
		RP7	The landscape is diverse and coherent	
	Extent	RP8	The landscape is spatially continuous, activating and enriching my perception	
		RP9	The landscape extends to me many beautiful associations and inspirations	
		RP10	There is a sense of belonging here that comes from	

#### Table A0. Cont.

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**RP11** 

RP12

nature

Here I feel at one with the environment

A place where I can enjoy myself very much

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Compatibility

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