

Article

Formation Mechanism of Tourists' Pro-Environmental Behavior in Wuyishan National Park, China, Based on Ecological Values

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Abstract: The establishment of a new type of natural protected area system with national parks as the main body is an inevitable trend of current development, and it is also an important ways to build a more beautiful China. During tourist visits, the national park will promote a variety of ways to enhance the ecological values of tourists. Ecological values can strengthen tourists' sense of identity, but their impact on tourists' pro-environmental behavior is not discussed. Based on this, Wuyishan National Park, a world natural and cultural heritage, is selected as the case site, and the PLS-SEM analysis method is used. An empirical test was conducted on 358 valid samples collected in the field. The results show the following: (1) tourists' ecological values and place identity can positively affect their pro-environmental behaviors; (2) place identity plays a mediating role between ecological values and tourists' pro-environmental behavior; (3) place dependence and place identity play a chain mediating role between ecological values and tourists' pro-environmental behavior; (4) according to the PLS-MGA test, gender and age can play a moderating role on the influence of ecological values on pro-environmental behavior. Therefore, the managers of national parks should pay attention to the cultivation of ecological values and consider tourist attraction, as well as formulating marketing strategies and other policy suggestions according to the different characteristics of tourists. The findings of this study offer both practical guidance and a theoretical underpinning for advancing ecological tourism within the framework of natural protected areas, with national parks playing a central role.

Keywords: national park; pro-environmental behavior; ecological values; place attachment; multigroup analysis; forest ecotourism



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1. Introduction

With the rapid development of China's economy, the contradiction between natural resource conservation and development has become increasingly prominent. The traditional mode of nature reserves is no longer suitable for the ecological development needs of the new era [1]. The creation of a new type of nature maintenance system centered on national parks is, thus, an essential step in creating a beautiful China and an inevitable trend of current development [2]. China's national parks are defined as specific land or marine areas approved and centrally managed by the state, with clear boundaries, aimed at protecting large-scale representative natural ecosystems of the country. The main goals are to protect biodiversity, preserve the authenticity and integrity of the natural ecosystem, and

use natural resources wisely while ensuring protection. As an important aspect of national park ecological product value realization, ecotourism has led many tourists who visit national parks to show spontaneous respect for nature through environmentally friendly behaviors. As a critically important activity in national park ecotourism, visitors' environmental behaviors can help regulate their behaviors during tourism, reduce impacts on the environment, and effectively reduce the cost of environmental protection while promoting the sustainable development of national park ecotourism. These actions may also have a cascading effect on environmental protection efforts, advancing China's development of an ecological civilization.

The concept of pro-environmental behavior refers to intentional actions taken by individuals to reduce the negative impact on natural and built environments [3]. In tourism research, pro-environmental behavior among tourists includes a series of benevolent actions towards ecological environments and their components in tourism destinations [4]. In recent years, more attention has been paid to the psychological causes and motivating factors of tourists' pro-environmental behavior by researchers in the field of ecotourism [5,6]. Existing studies predominantly center around the impact of tourists' psychological and perceptual dimensions on their pro-environmental behaviors [7]. The production of tourists' pro-environmental behaviors is closely related to their values [8]. Therefore, a minority of scholars have also delved into cultural values [9] and hedonistic and utilitarian value dimensions [10]. Among many values, ecological values have a predictive effect on environment-related attitudes and behaviors, so their important influence on tourists' pro-environmental behaviors has been widely recognized by the academic community [11,12]. However, existing studies have paid more attention to the impact of rational cognitive factors, such as environmental attitude [13], environmental cognition [14], and subjective norms, on tourists' pro-environmental behaviors [15], while relatively few studies have explored the deep psychological motivation and psychological mechanism of pro-environmental behaviors from the perspective of tourists' motivation. In particular, the existing research on the specific mechanism and boundary conditions of the impact of ecological values on tourists' pro-environmental behavior is still insufficient. To sum up, in order to fill the existing research gap, this study will explore the impact of ecological values on tourists' pro-environmental behaviors from the perspective of tourists, aiming to solve the following three questions: (1) How can ecological values better stimulate tourists' pro-environmental behaviors? (2) What intermediary mechanism exists? (3) Is the influence path influenced by demographics?

Wuyishan National Park is a model of "generational inheritance of cultural and natural heritage, coexistence of human and nature", with the goal of inspiring people to revere nature, cultivate correct ecological values, and enhance national pride [16]. At the same time, national parks are nature reserves with high ecological value [17]. Therefore, unlike other forms of tourism, national park tourism is a special form of tourism that blends education with recreation. The important influence of ecological values in the ecotourism of national park needs to be considered, which has dual significance for guiding national park practice and enriching the theoretical system of national park research. At the same time, existing studies have also shown that place attachment is an important intermediary variable in the analysis of human-place emotional connection in the field of environmental psychology, and it is also included in the influence mechanism of national park ecotourism [18,19]. In addition, existing research has also demonstrated that demographic variables are important determinant factors affecting behavioral tendencies [20]. The multi-group test (PLS-MGA) can effectively avoid the problems caused by heterogeneity [21]. To sum up, based on the perspective of ecological values, this study takes Wuyishan National Park as the research object and builds upon prior research on the place attachment and pro-environmental behavior of tourists. To further explore the underlying driving mechanisms of pro-environmental behavior in national park ecotourism, we also conducted a multi-cohort test. With the hope of proposing workable recommendations to support the sustainable development of national parks, this study's aim is to analyze, in greater detail,

the awakening process of tourists' ecological values toward pro-environmental behavior in national park tourism.

2. Literature Review and Hypothesis Development

2.1. Literature Review

National parks were first born in the United States, and research has led to rich practical experience in many countries around the world. With the establishment of the mechanism that national parks are the main body of nature protection systems in China, the research on national parks has led to many research results. The existing research is mainly discussed from three aspects: stakeholder research, ecotourism research, and ecological compensation research.

First, in terms of national parks stakeholder research, since being introduced into the tourism field at the end of the 20th century, stakeholder theory has been widely used. Bonye et al. adopted a qualitative case study, conducted interviews with 20 stakeholders, and summarized the feasible plans for forest resource management and sustainable development [22]. Ma [23] conducted in-depth discussions on the operation mode of the national park by stakeholders of Sanjiangyuan National Park. Using a mixed approach, scholars such as Ibrahim summarized recommendations for improving the well-being of park residents [24].

Second, in national parks ecotourism research, scholars such as Yu [25] pointed out that with the rapid and vigorous development of ecotourism in national parks, tourists' irresponsible environmental behavior has caused great pressure on the ecosystem. Therefore, environmental education in national parks is conducive to promoting the sustainable development of forest tourism, and in-depth research has been conducted on this issue [25]. Based on the survey data of national parks in China, Kang [26] established a functional relationship between tourist satisfaction and leisure attributes. They found that entertainment attributes can bring a lot of tourism welfare to tourists, while tourism congestion has a negative effect on tourists' satisfaction. Pulido-Fernandez [27] analyzed the limitations of the social carrying capacity of tourism in national parks and summarized the policy suggestions for sustainable destination management in national parks.

Third, for national parks ecological compensation research, improving the ecological compensation mechanism of national parks is an important part of establishing the national park system and is also a hot topic in the current reform of the national park system [22,28]. It is not difficult to find from the existing research that residents of national parks are not very willing to pay ecological compensation [29]. In addition, Zhou [30] took Ganjiangyuan National Wetland Park as the research object to discuss the ecological restoration and compensation standards of wetland parks, which have an important guiding role in the construction of a wetland protection system.

2.2. The Impact of Ecological Values on Tourists' Pro-Environmental Behavior

Values are seen as a crucial key to understanding consumer behavior, and research studies on the influence of values on consumer behavior have been conducted internationally for a long time [31]. Ecological values are an essential value orientation for promoting harmony between humans and nature. Specifically, it refers to people's evaluation of the connotation and importance of the ecological environment [32]. Feng [33] pointed out that ecological values are an important cultural foundation for China's ecological civilization construction. It is also the cornerstone of the ecological civilization idea for the new period and may help China advance its ecological civilization development to a new level. In the long course of historical development, ecological values have already been integrated into the Chinese people's value system and invisibly guide their behavior [34]. Tourists are the main participants in tourism. Scholars have constructed a theoretical model and conducted empirical tests that show a positive effect of ecological values on tourists' consumption behavior and propose a hierarchical theory of "values-attitudes-behavior" [35]. Moreover, some scholars have pointed out that values are guiding principles or beliefs for individual

behavior, having significant guidance for individual behavior and being the internal motivation of individual behavior [36]. Pro-environmental behavior is a functional aspect of belief and values, which significantly influences attitudes and environmental behavior [37]. Based on the above, this study posits the following hypothesis:

H1. *Ecological values can positively affect tourists' pro-environmental behavior.*

2.3. The Impact of place Attachment on Tourists' Pro-Environmental Behavior

Place attachment is the term used to describe people's emotional or psychological ties to a particular location [18], which is a key focus of environmental psychology, human geography, and other interdisciplinary fields [38,39]. Scholars have pointed out that place attachment can be divided into two dimensions: place identity and place dependence [40]. Place identity emphasizes the integration of personal values with the place and belongs to affective attachment, while place dependence reflects individuals' need for resources in the place and belongs to functional attachment. At the same time, place dependence can positively influence place identity [41]. Coghlan's [19] study showed that emotions stimulated by the environment can strengthen tourists' memories, promote the formation of a sense of place and affection for the place, and ultimately influence tourist behavior. Ahmad [42] also contended that location attachment is a crucial factor in the explanation of pro-environmental behavior. Therefore, to check the dependability of this hypothesis, he used meta-analysis to quantify the influence of place attachment on pro-environmental behavior and examined the background factors to make a case for the variability in result sizes reported in previous studies. Place attachment mainly manifests in the interaction between people and place. The findings demonstrate that place attachment generally has a favorable and modest impact on pro-environmental behavior [42]. In addition, the value-belief-norm theory (VBN) points to a causal relationship between the nature of personality (such as values and worldviews) and specific beliefs to individual attitudes, norms, and behaviors [43,44]. In this study, the formation of tourists' ecological values can lead to their attachment to Wuyishan National Park and ultimately influence their environmental protection behavior. Therefore, this study proposes the following hypotheses:

H2a. *Place identity has a positive impact on tourists' pro-environmental behavior.*

H2b. *Place dependence has a positive impact on tourists' pro-environmental behavior.*

2.4. The Mediating Effect of Place Attachment in the Relationship between Ecological Values and Pro-Environmental Behavior of Tourists

Place attachment has been identified as an important mediating variable in the mechanism by which tourist pro-environmental behavior is influenced, according to existing research. A tourist's psychological perception reinforces their connection with the surrounding environment, prompting a strong sense of place and ultimately leading to place attachment. This, in turn, impacts pro-environmental behavior [45]. Unlike cultural values, ecological values reflect the cognitive level of people's understanding of the importance and significance of the ecological environment [46]. Presenting tourists with the awe-inspiring power of nature in national parks' ecological tourism activities can easily elicit their ecological values, promoting their respect, compliance, and protection of nature. Ecological values are shown to enhance the positive interaction between tourists and locals, ultimately influencing the behavior of tourists during their travels. At the same time, Simangele [47] found that psychological perception directly affects place attachment and indirectly influences environmental responsibility behavior through place attachment. In summary, this study suggests that tourists' ecological values during ecotourism in Wuyishan National Park can stimulate a sense of dependency and identification, ultimately promoting pro-environmental behavior through chain mediation effects. Therefore, this study proposes the following hypotheses:

H3a. *Ecological values positively affect tourists' place identity.*

H3b. *Ecological values positively affect tourists' place dependence.*

H3c. *Place identity plays a mediating role between ecological values and tourists' pro-environmental behavior.*

H3d. *Place dependence plays a mediating role between ecological values and tourists' pro-environmental behavior.*

H3e. *Place dependence and place identity play a chain-like mediating role between ecological values and tourists' pro-environmental behavior.*

2.5. Multigroup Analysis Based on Demographic Characteristics

In social science research, if the data source is similar, it will be affected by heterogeneity. However, if the heterogeneity of the data is ignored, wrong conclusions may be generated [48], and the multigroup test (PLS-MGA) can effectively avoid the problems caused by heterogeneity [21]. Meanwhile, existing research has also demonstrated that demographic variables are important determinant factors affecting behavioral tendencies [20]. Cui and other scholars define the research objects as special customer groups with one or more statistical characteristics for market segmentation, and research verifies the influence of demographic variable characteristics on consumer behavior tendency and has achieved valuable results. It also proves that gender, educational background, and age can affect the formation process of behavioral intention, and tourists of different genders may lead to different decision-making behaviors [49,50]. Yaw [51] proved that gender can affect the process of generating behavioral intention, and tourists of different genders have different behavioral effects. During ecotourism activities in national parks, the variation in demographic factors, such as gender, age, education level, and income, among tourists can influence their pro-environmental behaviors. To sum up, to address the limitations of relying solely on aggregate or group-specific data, this study adopts a multigroup analysis approach. By using demographic factors, like gender, age, and income, as moderating variables, it aims to provide a more nuanced understanding of the relationships between different variables.

H4. *All variable relationships in the model exhibit significant differences among consumer groups of varying genders, ages, and incomes.*

The theoretical model for this study is presented in Figure 1.

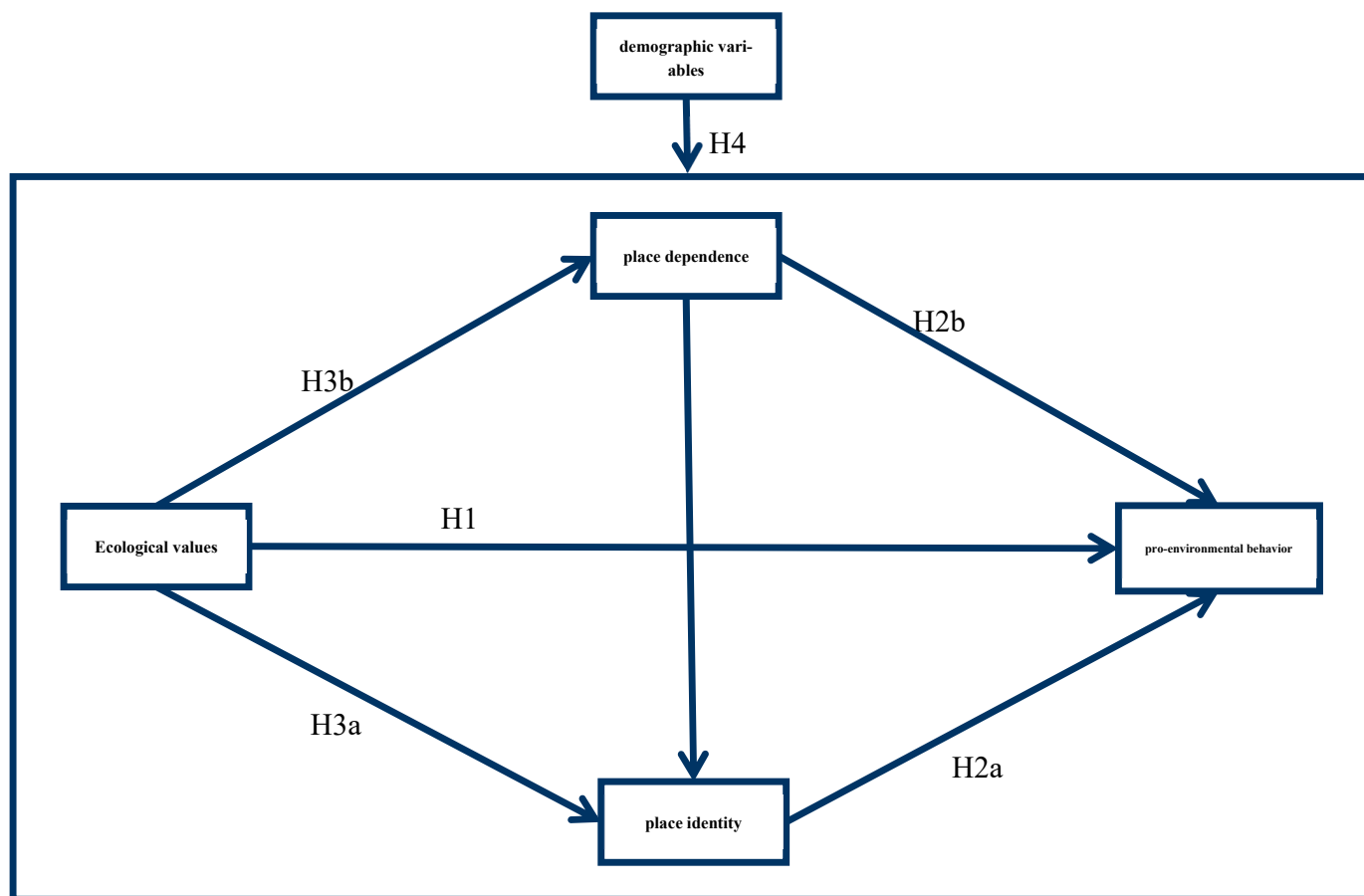


Figure 1. Theoretical model.

3. Research Design

3.1. Study Area

Wuyishan National Park spans across two Chinese provinces, Fujian and Jiangxi ($117^{\circ}24'13''$ E– $117^{\circ}59'19''$ E, $27^{\circ}31'20''$ N– $27^{\circ}55'49''$ N) (Figure 2) [52], one of the ten pilot regions for China's reform of the national park system. It was formally recognized in October 2021 as one of China's first national parks, having a total conservation area of 1280 km². It consists of Fujian Wuyishan Nature Reserve, Jiangxi Wuyishan Nature Reserve, Wuyishan National Park, Wuyishan National Scenic Area, and Wuyishan Tianchi National Forest Park. The only conservation area in China with both a World Biosphere Reserve and a World Cultural and Natural Heritage site is Wuyishan National Park. It acts as a role model for the transmission of cultural and natural legacy between generations and the peaceful coexistence of humans and nature. The park protects the world's largest and most representative mid-subtropical primary forest habitat for its latitude. Additionally, Wuyishan National Park boasts a rich variety of biodiversity, including 2799 registered higher plants, 239 species of algae, 558 species of wild vertebrates, 6849 species of insects, 139 species of higher aquatic plants, 67 species of zooplankton, and 104 species of fish, including nationally protected animals, such as black muntjac, Chinese pond turtle, and Chinese golden pheasant [53].

Over the years, Wuyishan National Park has adhered to the principle of natural restoration as its core, supplemented by biological measures and other conservation and restoration measures. It has also promoted genuine protection of forestry cultural heritage and vigorously developed new modes of ecological tourism that combine education with leisure travel, continuously guiding tourists to establish a correct ecological values perspective while promoting the realization of the ecological product value of national parks. Wuyishan National Park is rich in ecotourism products, such as eco-experience,

forest eco-tourism, and nature education, and the income from eco-cultural tourism continues to grow. According to the data, in 2022, a total of 1,802,100 tourists were received, and 678,300 tickets, 544,000 sightseeing tickets and 579,800 bamboo raft tickets were sold, achieving a total income of CNY 121 million [54].

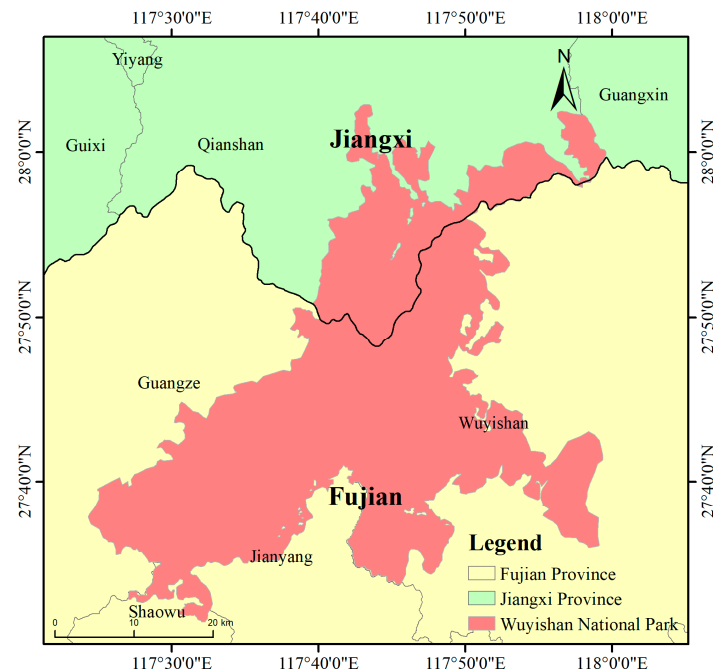


Figure 2. Geographical location.

3.2. Data Analysis

This study uses partial least squares structural equation modeling (PLS-SEM) to conduct empirical testing on the data. The reason for choosing PLS-SEM as the research method is that, compared to Covariance-based Structural Equation Modeling (CB-SEM), PLS-SEM is more suitable for analysis of small amounts of sample data. In addition, this study is still in the theoretical exploration stage, and PLS-SEM is suitable for predictive research and theoretical construction. Therefore, SmartPLS 3.0 is used to conduct empirical testing in this study.

3.3. Measurement

There are two parts to the questionnaire used in this study. The research model's four dimensions are represented by 14 items in the first section, each of which is scored on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The second part comprises background information about the respondents. This includes the place dependence scale derived from Ispas Ana et al.'s research [55], the scale for place identity was derived from Tonge J et al.'s study [56], the scale for ecological values was derived from Liang et al.'s research [57], and the scale for pro-environmental behavior was derived from Cologna et al.'s research [58]. Based on the actual conditions in the national park, all scales were modified. The English scales were translated into Chinese by professional translators to ensure the reliability of the questionnaire. In line with prior recommendations to enhance the research scale's reliability, this study utilized established scales from high-quality international publications, ensuring relevance to our research context [59]. To maintain the integrity of the original English questionnaire's meaning, an experienced English teacher was enlisted to translate it into Chinese and then back-translate it into English after necessary adjustments. This process aimed to ensure that the translated version faithfully conveyed the original's semantics, thereby upholding the study's validity [60].

4. Results

4.1. Data Collection

The formal questionnaires in this study were distributed and collected using a random sampling method, and all of them were carried out offline. Considering the increase in tourists participating in Wuyishan National Park tourism on weekends and holidays and the wider radiation range, the sample data obtained are more representative. Therefore, the paper questionnaire was distributed by the research team at Wuyishan National Park from 10 September 2023 to 5 October 2023. For example, during the Mid-Autumn Festival, National Day, and weekends, a research team was organized to charter a bus to Wuyishan National Park, and tourists were invited to fill out questionnaires from 10:00 to 16:00 every day. The team members briefly introduced the research content to the interviewees first and then issued the questionnaire to the tourists after asking for their consent. The average time for tourists to fill in the questionnaire was 15 min. In the end, a total of 400 questionnaires were distributed, among which 42 invalid questionnaires were excluded and 358 valid questionnaires remained, with an effective rate of 89.5%.

In the effective sample obtained in this study, 42.5% were male and 57.5% were female. The age was mainly concentrated between 18 and 40 years old. More than 78% of the respondents had a bachelor's degree or above. The monthly income per capita was mainly concentrated in three intervals: CNY 3001–6000, CNY 6001–9000, and CNY 9001–12,000, accounting for 22.3%, 31.0%, and 21.5%, respectively (see Table 1).

Table 1. Descriptive statistical analysis of the sample.

Items	Categories	Frequency	Percent (%)
Gender	Male	152	42.5%
	Female	206	57.5%
Age	18–30	160	44.7%
	31–40	132	36.9%
	41–50	43	12.0%
	51–60	18	5.0%
	61 or over	5	1.4%
Educational background	Senior high school and below	17	4.7%
	Junior college	60	16.8%
	Undergraduate	233	65.1%
	Graduate and above	48	13.4%
Monthly income (RMB)	3000 or below	49	13.7%
	3001–6000	80	22.3%
	6001–9000	111	31.0%
	9001–12,000	77	21.5%
	12,000 or over	41	11.5%

4.2. Measurement Model Assessment

For the reliability and validity test, as shown in Table 2, the factor loadings of the four variables in this study were all above 0.68. The Cronbach's α and composite reliability (CR) for each variable were both greater than 0.7. Moreover, the average variance extracted (AVE), which was always above 0.5, indicated good reliability and validity of the measurement model [61]. Further testing of the discriminant validity was carried out in this study utilizing the Fornell-Larcker criterion method, and the outcomes were generally regarded as satisfactory (Table 3) [61,62]. In addition, this study checked the variance inflation factor (VIF) values of the external variables that were used to determine the degree of collinearity and found that they were all between 1.178 and 1.560, indicating that the collinearity issue in this study was not severe [63].

Table 2. Reliability and validity test of the scale.

Constructs	Item Descriptions	Factor Loadings	Cronbach's α	CR	AVE
Ecological values	I believe that respecting ecology is important.	0.773	0.748	0.841	0.569
	I believe in harmonious coexistence with nature.	0.759			
	I believe that environmental protection is crucial.	0.731			
	I believe that preventing pollution is important.	0.755			
Place identity	I believe that I have become deeply immersed in the Wuyishan National Park.	0.686	0.745	0.839	0.567
	I really enjoy the Wuyishan National Park.	0.796			
	I completely agree with you about the Wuyishan National Park.	0.778			
	I have a special connection with Wuyishan National Park.	0.747			
Place dependence	The Wuyishan National Park is the epitome of a paradisiacal retreat for leisure and relaxation.	0.832	0.735	0.850	0.653
	Nowhere else can match the scenic beauty and top-notch services that Wuyishan National Park offers.	0.786			
	Spending a vacation in Wuyishan National Park is very enjoyable.	0.807			
Pro-environmental behavior	Upon witnessing someone causing damage to the environment in Wuyishan National Park, I shall file a report.	0.723	0.657	0.814	0.595
	I voluntarily participate in the voluntary service activities of Wuyishan National Park	0.763			
	I will convince my peers to protect the environment during our travels.	0.824			

Table 3. Fornell-Larcker criterion.

	Pro-Environmental Behavior	Place Dependence	Place Identity	Ecological Values
Pro-environmental behavior	0.771			
Place dependence	0.675	0.808		
Place identity	0.704	0.750	0.753	
Ecological values	0.706	0.678	0.735	0.755

Remark: AVE = average variance extracted; in bold = square-root of the AVE.

4.3. Direct Effect

The bootstrapping approach was used to assess the model's statistical significance using 5000 samples. The endogenous structures' coefficients of determination (R^2) varied from 0.460 to 0.657, showing a modest effect capacity for the structural model. Meanwhile, the effect correlation of endogenous components was assessed using Q^2 . In this study, all Q^2 values were greater than 0.000, indicating that the model has impact correlation and further confirming the stability of this study [64].

According to the SmartPLS analysis results shown in Table 4, firstly, ecological values have a significant positive effect on pro-environmental behavior ($\beta = 0.344$, $t = 5.064$, $p < 0.001$); ecological values also have a significant positive effect on place identity ($\beta = 0.420$, $t = 9.020$, $p < 0.001$); ecological values have a significant positive impact on place dependence ($\beta = 0.678$, $t = 17.449$, $p < 0.001$), indicating that hypotheses H1, H3a, and H3b are supported. This further indicates that ecological values, as an internal factor, can not only induce visitors to form place attachments but also directly drive the generation of pro-environmental behavior. Secondly, place identity has a significant positive influence on pro-environmental behavior ($\beta = 0.274$, $t = 4.096$, $p < 0.001$), while place dependence significantly affects how pro-environmental behavior develops ($\beta = 0.236$, $t = 3.372$, $p < 0.01$),

indicating that hypotheses H2a and H2b are supported. This suggests that a strong sense of place identity and place dependence can promote visitors' pro-environmental behavior.

Table 4. Hypothesis testing results.

Hypotheses	Effect [β -Value]	Boot SE [STDEV]	t-Value	p-Value
H1. Ecological values→Pro-environmental behavior	0.344	0.069	4.964	***
H2a. Place identity→Pro-environmental behavior	0.274	0.068	4.05	***
H2b. Place dependence→Pro-environmental behavior	0.236	0.071	3.337	0.001 **
H3a. Ecological values→Place identity	0.42	0.047	8.985	***
H3b. Ecological values→Place dependence	0.678	0.038	17.737	***

Note: *** $p < 0.001$, ** $p < 0.01$.

4.4. Mediation Effect

Table 5 displays the findings of the mediation effect analysis conducted for this study. Among the three hypothesized mediation paths, three were found to be significant, namely H3c, H3e, and H3d. The empirical results indicate the following: (1) ecological values can indirectly affect visitors' pro-environmental behavior through the mediating role of place identity; (2) through mediation analysis, it is found that ecological values can affect visitors' pro-environmental behavior by chain mediating through place dependence and place identity; (3) through the mediating effect of location dependence, environmental values can influence tourists' pro-environmental behavior.

Table 5. Results of mediating effect test.

Hypotheses	Effect [β -Value]	Boot SE [STDEV]	t-Value	p-Value
H3c. Ecological values→Place identity→Pro-environmental behavior	0.115	0.033	3.504	***
H3d. Ecological values→Place dependence→Pro-environmental behavior	0.16	0.047	3.379	0.001 **
H3e. Ecological values→Place dependence→Place identity→Pro-environmental behavior	0.115	0.033	3.504	***

Note: *** $p < 0.001$, ** $p < 0.01$.

4.5. Multigroup Analysis Based on Demographic Characteristics

To validate the moderating effect of demographic variables on the research model, this study employed the non-parametric confidence set method and utilized the multigroup analysis (PLS-MGA) function in SmartPLS 3.0 software to explore its influence [65]. In order to comply with the requirement that the difference between cases in categorical variables should not exceed two-times the standard deviation, a realistic situation was integrated with the multigroup analysis, which categorized the data into three groups based on gender, age, and income. In the first group, there were 152 male tourists and 206 female tourists. In the second group, there were 160 individuals below the age of 30 and 198 individuals above the age of 30. In the third group, there were 229 individuals with a monthly income exceeding CNY 6000, while 129 individuals had an income below CNY 6000. The data met the requirements for multigroup analysis and were consistent with reality, enabling further analysis. Table 6 displays the differential analysis of each path in the multigroup. The empirical results showed that the direct relationship between place dependence and pro-environmental behaviors was moderated by the demographic variables of age and income. Furthermore, the direct relationship between ecological values and pro-environmental behaviors was moderated by both gender and age. In addition, the indirect place dependence in the relationship between ecological values and pro-environmental behaviors was moderated by gender. Income did not have a significant impact on the model's significance, thus partially supporting hypothesis H4. The key findings are as follows.

Table 6. Results of PLS-MGA.

Hypotheses	Gender		Age		Income	
	<i>p</i> (Male)	<i>p</i> (Female)	<i>p</i> (>30)	<i>p</i> (≤30)	<i>p</i> (>6000)	<i>p</i> (≤6000)
H1. Ecological values→Pro-environmental behavior	0.309 **	0.364 ***	0.369 ***	0.273 *	0.372 ***	0.25 *
H2a. Place identity→Pro-environmental behavior	0.353 **	0.216 *	0.239 **	0.344 **	0.206 **	0.462 ***
H2b. Place dependence→Pro-environmental behavior	0.219 *	0.249 *	0.308 ***	0.13	0.323 ***	0.056
H3a. Ecological values→Place identity	0.512 ***	0.347 ***	0.596 ***	0.257 **	0.51 ***	0.37 ***
H3b. Ecological values→Place dependence	0.682 ***	0.684 ***	0.75 ***	0.583 ***	0.749 ***	0.555 ***
H3c. Ecological values→Place identity→Pro-environmental behavior	0.181 **	0.075 *	0.142 *	0.088 *	0.105 *	0.171 **
H3d. Ecological values→Place dependence→Pro-environmental behavior	0.149 *	0.17 *	0.231 ***	0.076	0.072 *	0.271 ***
H3e. Ecological values→Place dependence→Place identity→Pro-environmental behavior	0.1 **	0.074 *	0.05*	0.128 **	0.054 *	0.15 **

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

4.5.1. Gender

Regarding gender, the results showed that ecological values had a significant impact on place identity, place dependence, and pro-environmental behavior among both male and female tourist groups. Place identity had a significant effect on pro-environmental behavior in both male and female groups, while place dependence had a significant effect on pro-environmental behavior in either group. These findings suggest that gender has little impact on the influence of these variables. On the other hand, in the process of place dependence affecting the relationship between ecological values and pro-environmental behavior, male tourists were found to have a positive effect, promoting the formation of pro-environmental behavior among them. Additionally, gender had a similar effect on the chain mediation role of place dependence and place identity in the relationship between ecological values and pro-environmental behavior in the overall sample. Therefore, gender does not have a partial moderating effect on the process of pro-environmental behavior among tourists.

4.5.2. Age

In terms of age, first of all, ecological values have significant effects on place identity, place dependence, and tourists' pro-environmental behavior in groups over 30 years old and in groups over 30 years old and below, while place dependence has significant effects on pro-environmental behavior only in groups over 30 years old and not in groups under 30 years old. This shows that younger tourists have more emotional behaviors, while tourists over 30 years old are more inclined to have a sense of dependence on the place and then behaviors will follow. Moreover, the mediating effect of ecological values on pro-environmental behavior, the influence of place dependence, and the influence of place identity on the chain mediating effect of ecological values on pro-environmental behavior are significant, indicating that age has no influence on the mediating effect of ecological values on tourists' pro-environmental behavior. However, place dependence has a significant effect on the mediating effect of ecological values on pro-environmental behavior in the group over 30 years old but not in the group under 30 years old. This further illustrates the above relevant views on place dependence, indicating that younger tourists are more sensitive to travel behaviors, while tourists over 30 years old are more inclined to have a sense of dependence on the place before acting. In conclusion, the age of tourists has a partial regulating effect on the production process of tourists' pro-environmental behaviors.

4.5.3. Income

In terms of income, in the group with a monthly income of more than CNY 6000 and the group with a monthly income of CNY 6000 and below, ecological values have a significant impact on place identity, place dependence, pro-environmental behavior of tourists, and place identity on pro-environmental behavior. The effect of place dependence on pro-environmental behavior is significant in the group with a monthly income of more than CNY 6000 but not in the group with a monthly income of less than CNY 6000. This indicates that consumers with a monthly income of more than CNY 6000 pay more attention to whether the feelings brought by a tourism experience can affect their sense of dependence and happiness. Secondly, the mediating effect of place identity on ecological values and pro-environmental behavior, the mediating effect of place dependence on ecological values and pro-environmental behavior, and the effects of place dependence and place identity on the chain mediating effect of ecological values on pro-environmental behavior are consistent with the whole. To sum up, the income of tourists has a partially significant regulating effect on the production process of tourists' pro-environmental behaviors.

5. Discussion and Insights

Based on the survey data of ecotourism tourists in China's WuyiShan National Park, this study discusses the influence mechanism of tourists' pro-environmental behavior under the background of ecotourism in the national park. Next, our discussions and insights will revolve around the theoretical contributions and practical implications of this article.

5.1. Theoretical Contributions

First, this study is conducive to systematically revealing the impact of tourists' ecological values on pro-environmental behavior. Yu pointed out that more and different influencing factors can be explored under different scenarios, which still has important theoretical value for enriching relevant theoretical studies [66]. Although previous studies conducted a series of valuable in-depth analyses on the factors influencing tourists' pro-environmental behaviors in tourism contexts, relevant scholars have also proved that emotion and cognition [67], destination image [68], environmental knowledge [69], and place attachment [42] have predictive effects on tourists' pro-environmental behaviors. However, place attachment, as an important mediating variable affecting tourists' pro-environmental behaviors, has not yet been linked with ecological values by previous studies. In particular, few scholars have taken place attachment as a mediating variable to explore the mechanism of its influence on ecological values and tourists' pro-environmental behaviors. Therefore, from the perspective of ecological values, this study introduces place attachment and builds a chain mediation model, aiming to reveal that in the context of national park ecotourism, tourists' pro-environmental behaviors go through a detailed process of individual perception → functional cognition → emotional input → body reaction, which has a certain theoretical contribution to the "black box" that stimulates tourists' pro-environmental behaviors. At the same time, we believe that it can attract more researchers to pay attention to the important role of ecological values in whether tourists carry out pro-environmental behaviors in the process of ecotourism in national parks. Second, empirical research has proved that demographic variables have a partial regulating effect on each path in the model, which is consistent with the conclusion of Cui, who pointed out that demographic factors, such as race, age, and culture, have an impact on consumer behavior [70]. In this study, the relationship between ecological values and pro-environmental behavior was moderated by age and income among the demographic variables. This further shows that tourists of different ages and incomes have different original intentions to carry out ecotourism activities. This study is conducive to enriching the application of multigroup analysis (PLS-MGA). On the one hand, the impact of ecological values on tourists' pro-environmental behavior is different for tourists with different demographic characteristics. Therefore, cross-group comparative analysis can further deepen people's understanding of the differences in pro-environmental behaviors of tourists with different characteristics.

On the other hand, the existing multigroup analysis mainly uses CB-SEM to find the most suitable path model for multigroup analysis [42] and rarely uses PLS-MGA. Moreover, most studies on multigroup analysis only discuss the direct effect [71], and the influence of demographic variables on the mediating effect is not common. Therefore, based on the demographic characteristics of tourists, PLS-MGA was divided into three groups according to gender, age, and income to explore the regulatory effects of PLS-MGA on the direct or indirect effects of ecological values on tourists' pro-environmental behaviors, which provided a new perspective for reference for further research on multigroup analysis.

5.2. Practical Implications

First, national park managers should pay attention to the impact of tourists' ecological values and improve the production of tourists' pro-environmental behaviors. The results show that ecological values have a significant direct or indirect impact on tourists' pro-environmental behavior. Therefore, when Wuyishan National Park develops its eco-tourism program, national park managers should strengthen guidance in practice, increase the construction of ecological civilization concept publicity columns in national parks, and upload them to the Internet in combination with the introduction of scenic spots, so as to subtly guide tourists to form ecological values of nature. At the global level, national parks, such as Yellowstone National Park in the United States, Sochi National Park in Russia, Capivara Mountain National Park in Brazil, and Wuyishan National Park in China, should strengthen their educational and interpretive services. They should involve ecologists, environmental experts, and local guides to provide interpretive services, allowing visitors to gain a deeper understanding of the national park's ecosystem, including the ecological habits of animals and plants and the importance of ecological balance. This helps to raise awareness among tourists about ecological conservation and their sense of responsibility. Second, national park managers should focus on improving visitors' sense of place attachment. The results show that place attachment has a significant effect on tourists' pro-environmental behavior. Therefore, Wuyishan National Park should pay attention to the exploration and promotion of local traditional industries when formulating the ecotourism plan. The resources in Wuyishan National Park, such as tea culture, tea technology, tea industry, etc., should be studied. Through product display, experience activities, and other ways, tourists can observe the unique local lifestyle and cultural connotations, enhancing their local attachment to Wuyishan National Park. At the same time, for national park managers around the world, it is also necessary to strengthen tourists' interpretation and inheritance of the history and local stories of national parks, introduce the historical origins and traditional customs of national parks to tourists through guides, exhibition halls, and other ways, and arouse tourists' emotional identification and local attachment. In addition, national park managers should encourage interaction between communities around national parks and tourists, such as holding cultural exchange activities between local residents and tourists, promoting the connection between tourists and local communities, and enhancing tourists' sense of belonging to the local place. Third, according to the characteristics of different consumers, it is necessary to formulate guidance programs. The results show that age and income can influence the effect of ecological values on tourists' pro-environmental behavior. On the one hand, compared with tourists of 30 years old and below, tourists over 30 years old pay more attention to the sense of dependence and acquisition on tourism destinations, and they have a clear pursuit of tourism destinations. On the other hand, tourists with an income of less than CNY 6000 have more emotional behaviors, and with an increase in income level, tourists' travel behaviors gradually become rational. Therefore, in the next step, tourism managers of national parks should develop differentiated publicity strategies for tourists of different ages and different income levels, such as developing customized experience projects for tourists of higher ages or higher income levels to enhance tourists' sense of dependence and sense of gain; at a younger age or lower income level, the focus should be on the experience. At the same time, the targeted promotion of video accounts, public accounts, and Tiktoin is carried out through public service advertisements, so as to

stimulate the endogenous motivation of specific groups to protect the environment and guide tourists to actively carry out pro-environmental behaviors in ecotourism.

6. Research Conclusions and Prospects

6.1. Conclusions

One of the hot topics in tourism research in recent years is to explore the inducing mechanism of tourists' pro-environmental behavior from the perspective of psychology. Ecological values are an important variable affecting tourists' pro-environmental behavior, but few studies have focused on the mechanism of tourists' pro-environmental behavior from the perspective of ecological values. Based on this, from the perspective of tourists in the national park, this study uses PLS-SEM to explore the relationship between tourists' ecological values, place attachment, and pro-environmental behavior and their internal mechanism, taking Wuyishan, a world natural and cultural heritage, as a case. The research findings indicate that ecological values and place identity can positively affect tourists' pro-environmental behaviors. In addition, ecological values can influence tourists' pro-environmental behavior through the indirect effect of place attachment. Next, place dependence and place identity play a chain mediating role between ecological values and tourists' pro-environmental behavior. Finally, according to the PLS-MGA test, gender and age can play a moderating role in the influence of ecological values on pro-environmental behavior. This study deeply restores the decision-making psychology of tourists in the process of participating in ecotourism in national parks, which provides new ideas for understanding tourists' pro-environmental behavior and related psychological research.

6.2. Limitations and Future Research

There are some shortcomings in this study, which need to be further improved and expanded in the future. This study adopts a random sampling method to collect questionnaires. In the questionnaire design, the source of respondents is not specifically measured, and the heterogeneity of local tourists and foreign tourists may be an important factor affecting tourists' emotions. Therefore, the measurement of the tourist source can be considered in future research. This study focuses on the influence process of ecological values, local identity, local dependence, and other variables on pro-environmental behaviors, but tourism activities may lead to the vulnerability of the ecological environment [72], and environmental issues will also have an impact on tourism activities in national parks [73]. Therefore, in future research, environmental vulnerability, environmental problems, and other variables can be combined for exploration. What's more, only PLS-SEM was used in this study, which can be combined with grounded theory [74], fsQCA [75], the case study method [76], and other research methods to conduct mixed research in the future.

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