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Habitat comfort and emotional dimensions in rural tourism of Northeastern Sichuan Province in China: A basis for pro-environmental behavior framework

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Abstract

This study aimed to develop and validate a comprehensive framework that integrated habitat comfort, emotional dimensions, and pro-environmental behavior in the context of rural tourism in the Northeastern Region of Sichuan Province, China. Specifically, it described the demographic profile of the respondents in terms of sex, age, highest educational attainment, occupation, and visitor origin. It identified the level of habitat comfort of the respondents in terms of natural environment, spatial environment, human environment, and artificial environment. It examined the level of emotional dimension of the respondents in terms of pleasure, arousal, and dominance. It also examined respondents' pro-environmental behaviors in terms of conservation lifestyle, land stewardship, social environmentalism, and environmental citizenship. Additionally, it tested the significant differences in responses when grouped according to profile variables and the significant relationship between habitat comfort, emotional dimension, and pro-environmental behavior of tourists. Finally, it developed and validated a research framework based on the findings. The respondents of this study were 401 tourists who had traveled to the rural areas of northeastern Sichuan. Stratified random sampling method was used, determined using the Slovins formula with a margin of error of 5%. This study utilized both descriptive and quantitative research methods. The descriptive research method is a fact-finding study that accurately interprets the findings. Through exploration and analysis, this method reveals how habitat comfort and emotional dimensions influence tourists' pro-environmental behaviors in rural tourism in northeastern Sichuan Province, China. A quantitative approach was used to collect data significant to this study through questionnaires. Majority of respondents were between the ages of 27 and 42, with more women than men, and most had a college degree or higher, working in a variety of professions and dominated by domestic visitors. Habitat comfort has a significant positive impact on tourists' pro-environmental behavior. Habitat comfort has a significant positive effect on tourists' emotional dimensions. Emotional dimensions have a significant positive

effect on tourists' pro-environmental behavior. A framework of pro-environmental behavior based on habitat comfort and emotional dimensions was developed and validated based on the results of the study.

Keywords: habitat comfort, pro-environmental behavior, rural tourism

Habitat comfort and emotional dimensions in rural tourism of Northeastern Sichuan Province in China: A basis for pro-environmental behavior framework

1. Introduction

Protecting the ecological environment in any tourist destination should be a top priority as it is an important part of sustainability. Irresponsible environmental behaviors of some tourists may have negative impacts on the local ecological environment and the conflict between tourists and destinations (Li & Yang, ,2024). The structure of current tourism consumption indicates a trend towards optimization and upgrading. Tourists are no longer passive consumers of tourism services, but active experiencers of tourism and leisure. It is crucial for tourists to adapt to the tourism environment of rural destinations. Based on the "value-emotion-behavior" theory, Li et al. (2023) argued that individuals' perceptions of environmental problems stimulate their environmental emotions, which in turn affects their pro-environmental behaviors and pathways. The Secretary-General of the World Tourism Organization, Zurab Pololikashvili has noted that the resurgence of tourism has already made a significant contribution to global economic and employment growth. This underscores the importance of promoting sustainable tourism development.

Habitat comfort is used to measure how comfortable tourists feel about the environment they are in. It is a complex experience that includes feelings about nature, space, humanity, and artificiality (Qi, 2019). Tourists perceive the environment they are in when they are face to face with the destination. Destination environmental comfort is the basis for the management of tourists' environmental behavior, from which it reflects the degree of recognition and importance of pro-environmental behavior in tourist destinations. While the emotional dimensions in this study were based on the PAD Model proposed by Mehrabian and Russell (1978), which divides them into three basic dimensions: pleasure, arousal, and dominance. Pleasure pertains to the degree of happiness, joy, or satisfaction felt by the individual, while arousal refers to the degree of stimulation, alertness, excitement, and arousal. Dominance refers to the level of control and autonomy felt by an individual.

The main goal of pro-environmental behavior is to positively impact the environment. In the social context of global environmental governance, the key to bringing together human wisdom to cope with the negative impacts of environmental crises on human beings lies in revealing the deep roots of the formation of environmental crisis events, and the evaluation of environmental crisis events and the consequences of their behaviors based on the psychology of individuals and groups has become the basis for revealing the formation of environmental crisis events (Bai et al. ,2022). Various models have been developed based on different perspectives of researchers, and numerous empirical studies have been conducted to understand the mechanism of pro-environmental behavior. From a socio-demographic perspective, some scholars suggest that an individual's pro-environmental behavior may be influenced by the characteristics of their reference group, such as age and gender. Sun Y et al. (2020) suggest that awe may positively impact pro-environmental behavioral intention. They conducted three experiments and found that the degree to which different contexts induce pro-environmental behaviors may vary based on the actor's perceptual feedback perspective. Guo et al. (2019) found that perceiving environmental pollution has a positive impact on pro-environmental behaviors. Similarly, Sheng et al. (2020) discovered that individuals living near polluted areas tend to engage in pro-environmental behaviors to address environmental issues.

The northeastern region of Sichuan Province which is the research locale of the study is widely recognized for its distinctive natural scenery and significant human history. Rural tourism has experienced growth in this area, drawing in numerous visitors. The region offers a wide range of tourism resources, including stunning natural landscapes. Rural tourism programs here primarily focus on natural adventure and outdoor activities, providing tourists with opportunities to get closer to nature. Additionally, the northeast countryside is rich in history and culture, with local cultural activities and folklore performances allowing tourists to experience the

local customs. Moreover, the growth of rural tourism has contributed significantly to the local economy's prosperity. Villagers have been able to participate in the tourism industry by offering lodging and selling handicrafts, which has increased their sources of income. This mode of development has not only revitalized local agriculture and handicrafts but has also promoted the sustainable development of local communities. Therefore, this area is highly representative and valuable for research purposes.

This study presents a behavioral framework for the rural tourism environment based on habitat comfort and emotional dimensions. It explores the mechanisms behind tourists' attitudes and behaviors towards environmental protection through an in-depth study of the rural tourism environment in Northeast Sichuan Province. The study provides valuable insights for governmental departments to develop more effective environmental protection policies and tourism development plans. Additionally, it serves as a crucial reference for rural tourism practitioners to improve the attractiveness and competitiveness of tourism destinations. The study results are useful for environmental protection organizations and eco-volunteers, as they can support them in designing more targeted environmental protection activities and promotional strategies.

Objectives of the Study - This study aims to develop and validate a comprehensive framework integrating habitat comfort, emotional dimensions, and pro-environmental behavior in the context of rural tourism in the Northeastern Region of Sichuan Province, China. Specifically, it described the demographic profile of the respondents in terms of sex, age, highest educational attainment, occupation, and visitor origin. It identified the level of habitat comfort of the respondents in terms of natural environment, spatial environment, human environment, and artificial environment. It examined the level of emotional dimension of the respondents in terms of pleasure, arousal, and dominance. It also examined respondents' pro-environmental behaviors in terms of conservation lifestyle, land stewardship, social environmentalism, and environmental citizenship. Additionally, it tested the significant differences in responses when grouped according to profile variables and the significant relationship between habitat comfort, emotional dimension, and pro-environmental behavior of tourists. Finally, it proposed a research framework based on the findings.

2. Methods

Research Design - This study utilized both descriptive and quantitative research methods. The descriptive research method is a fact-finding study that accurately interprets the findings. Through exploration and analysis, this method reveals how habitat comfort and emotional dimensions influence tourists' pro-environmental behaviors in rural tourism in northeastern Sichuan Province, China. A quantitative approach was used to collect data significant to this study through questionnaires. A causal comparative research design is also incorporated to explore possible relationships between variables. The extent to which one variable influence another is inferred by comparing differences between groups.

Participants of the Study - The respondents of this study were 401 tourists who had traveled to the rural regions of northeastern Sichuan within 5 years. Stratified random sampling method was used, determined using the Slovins formula with a margin of error of 5%.

Data Gathering Instrument - The proponent of the study gathered the data using the survey questionnaire. The researcher investigated five typical rural tourist destinations, mainly including the average annual footfalls and gross revenues of the destinations, which helped in determining the number of questionnaires and collecting data for the study. Before each respondent formally filled out the questionnaire, the researchers asked them whether they had participated in rural tourism activities in Northeast Sichuan within the past five years, and an affirmative response was required to continue answering the questionnaire. After the survey, the researcher transferred the responses to Google Forms, counted, tabulated and coded them, and then handed them over to a statistician to analyze the data collected. The first section presents the demographic characteristics of the respondents, including age, sex, educational background, occupation, and origin of visitors; the second section presents the respondents' judgments of the habitat's comfort level; the third section presents the respondents'

assessment of the emotional dimensions; and the fourth section presents the respondents' expressions of pro-environmental behaviors.

Data Gathering Procedure - Frequency counts and percentages were used to describe the profile of the respondents. Weighted means and standard deviations were used to describe the comfort, emotional dimensions, and pro-environmental behaviors of rural habitats in northeast Sichuan. The t-test and ANOVA were used to assess significant differences in grouping variables based on respondents' profiles, and the correlation matrix and Pearson's r were used to determine significant relationships among variables.

Ethical Considerations - Ethical considerations were prioritized in the conduct of this study in accordance with the Code of Ethics, privacy act, and through the spirit of free and done voluntarily. The researcher ensured the welfare of the participants through orientation, repetition, and explanation, by answering their questions as they arise, ensuring that they understand each procedure, and by obtaining agreement from them. The researcher elicited their informed consent and in so doing manifested respect for their dignity and autonomy. The reasons for considering the participants suitable for the study will also be disclosed. All participants were informed verbally about the purpose and possible output of the research before participating in the study. Hence, shared information by the respondents was handled with the utmost confidentiality and assured anonymity.

Data Analysis - Frequency counts and percentages were used to describe the profile of the respondents. Weighted means and standard deviations were used to describe the comfort, emotional dimensions, and pro-environmental behaviors of rural habitats in northeast Sichuan. The t-test and ANOVA were used to assess significant differences in grouping variables based on respondents' profiles, and the correlation matrix and Pearson's r were used to determine significant relationships among variables.

3. Results and discussion

Table 1

Frequency Table for the Respondent's Profile

Profile	Frequency (*f*)	Percentage (%)
Age		
18 – 26 years old	136	33.9
27 – 42 years old	153	38.2
43 – 58 years old	88	21.9
59 years old and above	24	6.0
Sex		
Male	196	48.9
Female	205	51.1
Educational Background		
Elementary Graduate	13	3.2
High school graduate	126	31.4
College Graduate	182	45.4
Graduate School Graduate	80	20.0
Occupation		
Employed in the tourism industry	78	19.5
Employed in other sectors	184	45.9
Business owners	103	25.7
Unemployed	13	3.2
Student	23	5.7
Visitor Origin		
Domestic	398	99.3
Foreign	3	.7

Table 1 presents the percentage distribution of respondents. The largest group of respondents were aged between 27-42 years old, accounting for 153 or 38.2% of the respondents, followed by 18-26 years old, accounting for 136 or 33.9% of the respondents, then 43-58 years old, accounting for 88 or 21.9% of the respondents, and finally 59 years old and above, accounting for 24 or 6.0% of the respondents. This data clearly

indicates that most participants in rural tourism activities in Northeast Sichuan are young people aged 18-26 and middle-aged individuals aged 27-42. Younger and middle-aged individuals are often energetic and seek to relieve stress from work and studies through tourism activities. They are also looking to gain personal experiences and fulfill their social needs. Che et al. (2021) discovered a strong demand for tourism among middle- and young-aged groups, with 49.8% of respondents between the ages of 26 and 30, and 36.3% between the ages of 31-40. These results support the promotion of rural tourism in Inner Mongolia. The study also found that 196 or 48.9% of the respondents were male and 205 or 51.1% were female. The study confidently reports that most respondents were female. According to Liu et al. (2023), women are more likely to participate in taking photos of tourist destinations and post twice as many selfies on social media as men.

In terms of the educational background of the respondents, most of the respondents were college graduates, 182 or 45.4%; high school graduates, 126 or 31.4%; graduate students, 80 or 20%; and elementary school graduates, only 13 or 3.2%. The overall education level is high. Regarding the occupation of the respondents, most of the respondents were employed, with only 13, or 3.2%, unemployed. Among them, 184 people are distributed in various industries, or 45.9%; 23 people are now students, or 5.7%; there are 78 people, or 19.5%, engaged in tourism-related work, which may have scenic spot personnel participating in the questionnaire survey, and on the other hand, it also indicates that the tourism industry has brought about a considerable number of employment positions.

Lastly, the origin of the respondents shows that only 3 came from abroad, while the rest were domestic Chinese tourists. This suggests that international cultural exchanges can be added to the marketing and promotion of rural tourism destinations to increase the interest of foreign tourists in Chinese rural tourism destinations.

Respondents' assessment of level of habitat comfort specifically in terms of natural environment. Results showed that the respondents moderately agreed with the listed statements with a computed mean of 2.70. The natural environment has a far-reaching influence on tourists' behavior. On the other hand, natural landscapes allow tourists to intuitively understand the ecosystem and promote environmental protection behaviors, this can be confirmed in the following scholarly studies. Yin et al. (2023) found that the beauty and pleasantness of the natural environment in scenic areas affect tourists' emotional experience, which in turn stimulates their ecological values and ecological worldviews. Xu et al. (2021) showed that the state of preservation of natural environments in scenic areas affects tourists' sense of environmental responsibility and anticipatory guilt, which in turn promoting their pro-environmental behavior.

Table 2

Assessment of Habitat Comfort

	Mean	Interpretation	Rank
Natural Environment	2.70	Moderately Agree	1.5
Spatial Environment	2.70	Moderately Agree	1.5
Artificial Environment	2.60	Moderately Agree	4
Human Environment	2.67	Moderately Agree	3
Overall	*2.67*	*Moderately Agree*	

Legend: 1.00 – 1.49 Strongly Agree, 1.50 – 2.49 Agree, 2.50 – 3.49 Moderately Agree, 3.50 – 4.49 Disagree, 4.50 – 5.00 Strongly Disagree

Table 2 presents the composite mean of the aggregated independent variables of habitat comfort (2.67). the habitat comfort independent variables were ranked as follows; natural environment and spatial environment tied for first place (2.70), followed by human environment (2.67), and artificial environment ranked last, with all variables verbally interpreted as moderately agree. In the rural tourism experience, tourists valued the natural and spatial environments equally. Respondents indicated that one of the main reasons for choosing rural tourism is that they want to escape the hustle and bustle of the city and immerse themselves in nature. Artificial

environment ranks the lowest among the four indicators of habitat comfort (2.60). This indicates that tourists have higher requirements for the construction of artificial environment in rural tourism destinations. The most common problems of current rural tourism are centered on infrastructure construction, ecological protection of scenic spots, and publicity and service quality. Xia et al. (2020) proposed that the countryside should create a good production and living environment, maintain a friendly local flavor, create a harmonious artificial landscape, and form a unified overall aesthetic with the surrounding environment based on the premise of sustainable development of human settlements in landscape evaluation, which specifically requires a clean village, widening the roads into the village, constructing sewage networks according to the standards, and providing complete living facilities.

Table 3

Assessment of Emotional Dimension

	Mean	Interpretation	Rank
Pleasure	2.72	Moderately Agree	2
Arousal	2.67	Moderately Agree	3
Dominance	2.75	Moderately Agree	1
Overall	2.71	Moderately Agree	

Legend: 1.00 – 1.49 Strongly Agree, 1.50 – 2.49 Agree, 2.50 – 3.49 Moderately Agree, 3.50 – 4.49 Disagree, 4.50 – 5.00 Strongly Disagree

Table 3 presents the composite mean (2.71) of the aggregated emotional dimension variables. The rankings of the emotional dimension variables were as follows: dominance (2.75), followed by pleasure (2.72), and arousal (2.67), with the verbal interpretation of moderately agree. Sun et al. (2020) developed a model to explain the relationship between perceived value and behavioral intention using the theory of cognitive-emotional-intentional relationship. The study found that tourists may have varying levels of attachment to their destination. Place attachment refers to the emotional connection that tourists feel towards a place based on their cognitive understanding of it. Ultimately, place attachment has a positive impact on place identity. Furthermore, arousal was ranked at the bottom of the list in the context of tourism. This term refers to the level of stimulation or excitement that tourists feel in the environment. However, excessive arousal may cause anxiety or nervousness, negatively impacting their satisfaction and overall experience.

Table 4

Assessment of Pro-environmental Behavior

	Mean	Interpretation	Rank
Conservation Lifestyle Behaviors	2.73	Moderately Agree	2
Social Environmentalism	2.66	Moderately Agree	3
Environmental Citizenship	2.75	Moderately Agree	1
Land stewardship	2.63	Moderately Agree	4
Overall	*2.69*	*Moderately Agree*	

Legend: 1.00 – 1.49 (Strongly Disagree), 1.50 – 2.49 (Disagree), 2.50 – 3.49 (Moderately Agree), 3.50 – 4.49 (Agree), 4.50 – 5.00 (Strongly Agree

Table 4 presents the average score (2.69) for the dependent variables of pro-environmental behavior. The ranking of the dependent variables for pro-environmental behavior is as follows: environmental citizenship ranks first (2.75), conservation lifestyle behaviors rank second (2.73), social environmentalism ranks third (2.66), and land stewardship ranks last (2.63). All variables are described as moderately agree. Wei et al. (2023) investigated the effects of psychological enrichment on pro-environmental behavior and concluded that both trait-based and state-based psychological enrichment can increase an individual's willingness to engage in pro-environmental behavior. According to Binder et al. (2020), pursuing happiness on the journey is not contradictory to pro-environmental behavior. Social environmentalism and land stewardship. Currently, China is undergoing

rapid urbanization, and many people prioritize economic development and material interests over environmental concerns. Residents, as the primary agents of ecological environmental protection, bear the responsibility of safeguarding the environment, enhancing it, and addressing ecological and environmental issues.

Table 5

Differences on the Level of Habitat Comfort when Compared According to Profile

	t/F	p-value	Interpretation
Age			
Natural Environment	6.438	.000	Significant
Spatial Environment	2.310	.076	Not Significant
Artificial Environment	3.211	.023	Significant
Human Environment	1.547	.202	Not Significant
Sex			
Natural Environment	-3.530	.000	Significant
Spatial Environment	-4.621	.000	Significant
Artificial Environment	-4.043	.000	Significant
Human Environment	-3.637	.000	Significant
Educational Background			
Natural Environment	10.196	.000	Significant
Spatial Environment	6.805	.000	Significant
Artificial Environment	6.729	.000	Significant
Human Environment	4.148	.007	Significant
Occupation			
Natural Environment	3.527	.008	Significant
Spatial Environment	1.569	.182	Not Significant
Artificial Environment	1.641	.163	Not Significant
Human Environment	1.113	.350	Not Significant
Visitor Origin			
Natural Environment	-1.181	.238	Not Significant
Spatial Environment	.305	.761	Not Significant
Artificial Environment	-.863	.389	Not Significant
Human Environment	-2.120	.035	Significant

Legend: Difference is significant at 0.05 alpha level

Table 5 shows the differences in comparing habitat comfort according to profiles. The results indicate a significant difference between natural (p-value = 0.000) and artificial (p-value = 0.023) environments concerning age. Tourists of different age groups perceive the comfort level of human habitats differently during their travels.

Regarding gender, there are notable differences in all four habitat dimensions, indicating a high degree of variability in environmental perception across genders. Women tend to prioritize comfort and detail, requiring higher levels of bed softness, hygiene, and room decoration, and are more concerned with the safety of the travel destination. In contrast, men may prioritize practicality and convenience over comfort and may show a greater interest in activity programs and amenities at the travel destination. Li et al. (2021) noted in their study on creating livable environments for the elderly that there are gender differences in daily leisure activities and usage of urban public facilities in China. Male elderly have a larger range of daily leisure activities and higher usage rates of urban public facilities than female elderly. This highlights the need for continuous attention to the problem of neglecting male elderly in the creation of environmental atmosphere in the facilities. The study also found that different genders have different perceptions of the living environment.

In terms of the origin of tourists, there was a significant difference in the perception of the human environment among tourists of different nationalities while traveling (p=0.035). Perhaps, the difference mainly stems from the differences in cultural background and emotional factors. Domestic tourists usually have a deep affection for their own country's history and culture, and therefore have a deeper perception of and emotional attachment to local attractions. Zhang et al. (2023) argued that unlike foreign analogies of the countryside as a wilderness and a wilderness, China's countryside emphasizes the humanistic atmosphere, or humanistic environment, formed by the two-way interaction of culture and environment. Therefore, foreign tourists are often curious about China's humanistic and historical environment.

Table 6
Differences on the Level of Emotional Dimension when Compared according to Profile

	t/F	p-value	Interpretation
Age			
Pleasure	5.138	.002	Significant
Arousal	3.562	.014	Significant
Dominance	5.898	.001	Significant
Sex			
Pleasure	-3.673	.000	Significant
Arousal	-4.706	.000	Significant
Dominance	-3.434	.001	Significant
Educational Background			
Pleasure	7.711	.000	Significant
Arousal	6.164	.000	Significant
Dominance	6.663	.000	Significant
Occupation			
Pleasure	2.837	.024	Significant
Arousal	2.840	.024	Significant
Dominance	3.133	.015	Significant
Visitor Origin			
Pleasure	-.032	.975	Not Significant
Arousal	-.201	.841	Not Significant
Dominance	-1.618	.107	Not Significant

Legend: Difference is significant at 0.05 alpha level

Table 6 shows the differences in the levels of the emotional dimensions when compared according to the profiles. The results show that: There were significant differences in all three emotional dimensions with respect to age. Adolescents are more likely to be attracted to novelty and exciting experiences, and are more interested in the fun and excitement of activities during their trips, and tend to experience and express emotions through sensory stimulation; adults are more interested in the pleasures of relaxation, enjoying good food, and exploring cultures, and are more attracted to emotionally resonating things such as history, culture, and nature; and older adults are more interested in the pleasures of spending time with family and friends and reminiscing about the past; and older adults are more interested in the pleasures of spending time with family and friends and reminiscing about the past. The elderly, on the other hand, focus more on the pleasure of spending time with family and friends and reminiscing about the past, and are more likely to choose places or activities that evoke good memories, and are more likely to participate in organized tours or group trips to reduce the pressure of planning and decision-making.

In terms of dominance, people in creative occupations are more inclined to be exploratory and creative, and make their own itineraries and decisions, while people in business occupations are more inclined to participate in

business tours or company-organized travel activities. Zhang et al. (2023), based on the affective event theory, argued that different occupational shocks can trigger different affective responses. Specifically, occupational shocks may not only bring short-term emotional fluctuations to employees but may also further affect individuals' work attitudes and ultimately influence their behavioral outcomes. Regarding the source of visitors, there was no significant difference among the three emotional dimensions.

Table 7

Differences on the Pro-environmental Behavior when Compared according to Profile

	t/F	p-value	Interpretation
Age			
Conservation Lifestyle Behaviors	7.298	.000	Significant
Social Environmentalism	4.705	.003	Significant
Environmental Citizenship	5.854	.001	Significant
Land stewardship	11.936	.000	Significant
Sex			
Conservation Lifestyle Behaviors	-5.140	.000	Significant
Social Environmentalism	-5.352	.000	Significant
Environmental Citizenship	-2.565	.011	Significant
Land stewardship	-5.644	.000	Significant
Educational Background			
Conservation Lifestyle Behaviors	11.163	.000	Significant
Social Environmentalism	5.292	.001	Significant
Environmental Citizenship	4.124	.007	Significant
Land stewardship	13.883	.000	Significant
Occupation			
Conservation Lifestyle Behaviors	3.188	.014	Significant
Social Environmentalism	3.763	.005	Significant
Environmental Citizenship	3.665	.006	Significant
Land stewardship	6.076	.000	Significant
Visitor Origin			
Conservation Lifestyle Behaviors	-.708	.479	Not Significant
Social Environmentalism	1.051	.294	Not Significant
Environmental Citizenship	.934	.351	Not Significant
Land stewardship	.204	.838	Not Significant

Legend: Difference is significant at 0.05 alpha level

Table 7 presents the differences in pro-environmental behaviors for comparisons based on profile. The results indicate as described below. With respect to age, all four dimensions of pro-environmental behavior showed significant levels (p-value < 0.05). Tourists aged 18 - 26 years old are more inclined to seek excitement and adventure, prioritize personal pleasure and experience, prefer affordable travel options, and may show more caution about participation in environmental programs. Tourists aged 27 - 42 years old usually focus on comfort and convenience, but also have a certain degree of environmental awareness and are more willing to choose tourism services and products that support environmental initiatives but may weigh environmental protection against comfort in practice. 43 - 58-year-olds are more focused on cultural heritage and historical attractions and have a higher degree of environmental protection and cultural preservation, preferring traditional destinations and experiences, and are willing to actively participate in relevant environmental protection and cultural preservation programs. 59 years old and above may prioritize fun and experiences and may be more cautious about participating in environmental protection programs. projects. Jia et al. (2015) in a study of tourists' environmental responsibility behaviors showed that age directly affects tourists' environmental responsibility

behaviors, and that older tourists' environmental responsibility behavior is better, which may be because older tourists pay more attention to information about sustainable tourism with the accumulation of knowledge and experience, and may have more time and energy to participate in educational activities related to environmental protection, which is consistent with the findings of this study.

For gender, all four dimensions of pro-environmental behavior showed significant levels (p-value < 0.05). Tourists who identify as male tend to prioritize technical and practical methods of environmental protection, such as utilizing eco-friendly technology or supporting innovation in this field. Additionally, they are more inclined to participate in hands-on environmental efforts, such as taking part in clean-up activities, conservation projects, or volunteering for environmental organizations. In contrast, male and female tourists may have different priorities when it comes to environmental issues. Zhang (2023) found a significant correlation between gender and pro-environmental behavior, consistent with this study's findings.

Educational background showed significant levels (p-value < 0.05) for all four dimensions of pro-environmental behavior. Individuals with higher levels of education generally possess a wider range of environmental knowledge and awareness and are more likely to support environmentally sustainable actions that are scientifically grounded and consistent with the principles of sustainable development. This suggests a link between education level, environmental knowledge, and pro-environmental behavior. About occupation, all four dimensions of pro-environmental behavior showed significant levels (p-value < 0.05). White-collar professionals tend to prioritize the urban environment and quality of life, often supporting environmental actions such as waste recycling, energy conservation, and emission reduction. Blue-collar professionals, on the other hand, may be more concerned about personal livelihood and economic pressure, and have relatively low environmental awareness, placing environmental actions on the back burner. In Wang's (2021) study on the factors influencing urban residents' pro-environmental behaviors showed that there was a significant difference between residents' occupations and residents' pro-environmental behaviors in both the public and private spheres, indicating that occupations have a greater impact on people's pro-environmental behaviors.

Table 8

Relationship of the Level of Habitat Comfort to Emotional Dimension

	r	p-value	Interpretation
Natural Environment			
Pleasure	.441**	.000	Significant
Arousal	.413**	.000	Significant
Dominance	.425**	.000	Significant
Overall Emotional Dimension	.536**	.000	Significant
Spatial Environment			
Pleasure	.378**	.000	Significant
Arousal	.433**	.000	Significant
Dominance	.463**	.000	Significant
Overall Emotional Dimension	.538**	.000	Significant
Artificial Environment			
Pleasure	.429**	.000	Significant
Arousal	.383**	.000	Significant
Dominance	.361**	.000	Significant
Overall Emotional Dimension	.489**	.000	Significant
Human Environment			
Pleasure	.435**	.000	Significant
Arousal	.408**	.000	Significant
Dominance	.416**	.000	Significant
Overall Emotional Dimension	.528**	.000	Significant

Legend: Relationship is significant at 0.05 alpha level

Table 8 presents the relationship between habitat comfort and emotional dimensions and the results are described below. The natural environment showed significant levels (p-value < 0.05) with all three emotional dimensions. In pleasure degree, beautiful natural landscape and fresh air help to enhance people's emotional

pleasure. In arousal, elements of nature such as wildlife or climate change can trigger excitement and alertness. Shao et al. (2023) found that destinations can stimulate the senses of tourists in order to awaken their emotions and establish their perception of natural attractions, which is more conducive to the outburst of their emotions, and then optimize their evaluation of the experience. The beautiful natural environment is the most direct and effective way to stimulate tourists' senses.

The spatial environment presents a significant level (p-value < 0.05) with all three emotional dimensions. The design and atmosphere of the spatial environment will directly affect people's pleasure. According to Wang et al. (2021), the visual quality of various environmental and architectural features, such as man-made landscapes, spatial nodes, historical architecture, and streetscapes, can influence tourists' emotions. The study found that spatial node landscape had the greatest impact on tourists' emotions, followed by street landscape, artificial environment landscape, and historical architecture landscape. Also, the artificial environment showed significant levels (p-value < 0.05) with all three affective dimensions. The design and layout of artificial environments can have a direct impact on people's emotional experience. Factors such as comfortable interior design, beautiful architectural structure, and interior decoration can enhance people's emotional pleasure. Human environment showed significant level (p-value < 0.05) with all three affective dimensions. Humanistic environments, such as historical cities and cultural and artistic neighborhoods, have a profound effect on emotion. Chenn et al. (2023), in a study of red tourism attractions (humanistic attractions, specifically those related to revolutionary history), concluded that the ambient environment, as an important affective touchpoint, positively influences tourists' positive and negative emotions, which may be due to the fact that red tourism destinations, as a cultural heritage, carry a strong spiritual heritage and a rich spiritual culture, and that they can be used to promote the development and development of the humanistic environment.

Table 9

Relationship of the Level of Habitat Comfort to Characteristics Pro-environmental Behavior

	r	p-value	Interpretation
Natural Environment			
Conservation Lifestyle Behaviors	.384**	.000	Significant
Social Environmentalism	.307**	.000	Significant
Environmental Citizenship	.360**	.000	Significant
Land stewardship	.368**	.000	Significant
Overall Pro-environmental Beh.	.486**	.000	Significant
Spatial Environment			
Conservation Lifestyle Behaviors	.414**	.000	Significant
Social Environmentalism	.408**	.000	Significant
Environmental Citizenship	.408**	.000	Significant
Land stewardship	.402**	.000	Significant
Overall Pro-environmental Beh.	.559**	.000	Significant
Artificial Environment			
Conservation Lifestyle Behaviors	.352**	.000	Significant
Social Environmentalism	.330**	.000	Significant
Environmental Citizenship	.430**	.000	Significant
Land stewardship	.340**	.000	Significant
Overall Pro-environmental Beh.	.495**	.000	Significant
Human Environment			
Conservation Lifestyle Behaviors	.400**	.000	Significant
Social Environmentalism	.326**	.000	Significant
Environmental Citizenship	.417**	.000	Significant
Land stewardship	.395**	.000	Significant
Overall Pro-environmental Beh.	.526**	.000	Significant

Legend: Difference is significant at 0.05 alpha level.

Table 9 presents the relationship between human comfort and pro-environmental behavior and the results are described below. All four dimensions of natural environment and pro-environmental behavior showed significant levels (p-value < 0.05). On the one hand, a good natural environment triggers positive perceptions and attitudes

towards nature among tourists, such as aesthetic appreciation and ecosystem importance. Beautiful natural landscapes tend to enhance tourists' emotional state and prompt them to display more environmentally friendly behaviors. Yu et al. (2022) investigated the relationship between local attributes of ski tourism destinations and tourists' pro-environmental behaviors, categorized local attributes into natural and social environmental attributes, and constructed the pathway of natural environmental attributes→tourists' value perception→pro-environmental behaviors. The results show that the natural environment affects tourists' pro-environmental behavior. The four dimensions of human environment and pro-environmental behavior are all significant (p-value < 0.05). Specialties, customs, celebrities and other factors constitute a colorful humanistic environment, and these factors not only shape tourists' cultural identity, but also influence their attitudes and behaviors towards the environment. Sun et al. (2020) found a positive correlation between the factor of tourists' environmentally responsible behaviors and tourists' traditional dietary tourism preferences and suggested that different types of tourists' dietary preferences for agro-cultural heritage.

Table 10

Relationship of the Level of Pro-Environmental Behavior to Emotional Dimension

	r	p-value	Interpretation
ConservationLifestyleBehaviors			
Pleasure	.405**	.000	Significant
Arousal	.410**	.000	Significant
Dominance	.422**	.000	Significant
Overall Emotional Dimension	.520**	.000	Significant
Social Environmentalism			
Pleasure	.367**	.000	Significant
Arousal	.385**	.000	Significant
Dominance	.359**	.000	Significant
Overall Emotional Dimension	.466**	.000	Significant
Environmental Citizenship			
Pleasure	.379**	.000	Significant
Arousal	.437**	.000	Significant
Dominance	.426**	.000	Significant
Overall Emotional Dimension	.523**	.000	Significant
Land Stewardship			
Pleasure	.345**	.000	Significant
Arousal	.411**	.000	Significant
Dominance	.388**	.000	Significant
Overall Emotional Dimension	.482**	.000	Significant

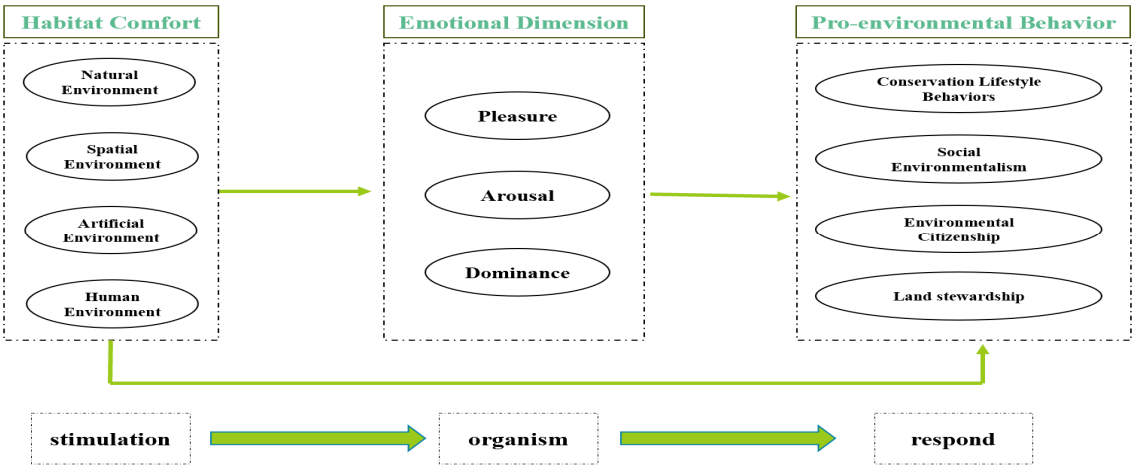
Legend: Difference is significant at 0.05 alpha level.

Table 10 presents the relationship of the level of pro-environmental behavior to emotional dimension. Conservation lifestyle behaviors showed significant levels (p-value < 0.05) with all three emotional dimensions. Conservation lifestyle usually involves concern for the environment, a sense of responsibility, and action, and these behaviors may evoke positive emotional experiences such as satisfaction and accomplishment and may also stimulate moral emotions such as responsibility and compassion.

Social environmentalism showed significant levels (p-value < 0.05) with all three affective dimensions. Social environmentalism encourages individuals to participate in social interactions and exchanges, and this participation may enhance the emotional connection between individuals and the environment. Wang et al. (2022) pointed out that public domain pro-environmental behaviors refer to the environmental behaviors that the public can only take in situations that require interaction with others, such as joining an environmental protection

organization, participating in environmental public welfare activities, and appealing to others to protect the environment, among other behaviors. Environmental citizenship showed significant levels (p-value < 0.05) with all three emotional dimensions. Individuals who engage in environmental citizenship behaviors connect with others who are also concerned about the environment and share each other's emotional experiences by participating in political activities such as environmental groups and public meetings. Land stewardship showed significant levels (p-value < 0.05) with all three affective dimensions. This emotional connection and sense of belonging helps to increase an individual's emotional identification with the land and sense of responsibility, leading to more active participation in land conservation and management activities. Li et al. (2019) pointed out in an empirical study of place attachment and pro-environmental behaviors of bird-watching tourism tourists that there is an obvious emotion of place attachment among bird-watching tourists, and this emotion promotes the emergence of pro-environmental behaviors.

Figure 1. Proposed Framework for Pro-environmental Behavior



Habitat environment includes the natural environment (such as landscape scenery, air quality), spatial environment (such as landscape design, architectural style), human environment (such as cultural traditions, historical relics) and artificial environment (such as infrastructure, public service facilities). These factors, together, constitute the habitat environment in rural tourism, which directly affects the sensory experience and emotional response of tourists. The emotional dimension of tourists is explained based on the PAD model, which includes the emotional experience in terms of pleasure, arousal and dominance. In rural tourism, tourists may feel pleasure and relaxation from natural beauty, excitement and thrill from participating in local cultural activities, or intimacy and confidence from communicating with local residents. Tourists' pro-environmental behaviors are manifested in conservation lifestyle, land stewardship, social environmentalism and environmental citizenship. These behaviors reflect tourists' concern for and involvement in the environment and reflect their value and respect for the rural environment.

In rural tourism, there is a close interrelationship between habitat comfort, tourists' emotional dimension, and pro-environmental behavior. This positive pro-environmental behavior not only reflects tourists' concern and support for the environment, but also helps to enhance the sustainable development of rural tourism. Finally, the habitat comfort also directly affects tourists' pro-environmental behavior. Good habitat conditions can stimulate tourists' care and responsibility for the environment, thus prompting them to participate more actively in environmental protection and improvement activities and contribute to the development and environmental sustainability of rural tourism. Consequently, a virtuous circle relationship chain is established between habitat comfort, tourists' emotional dimension, and pro-environmental behavior, which collectively facilitate the sustainable development of rural tourism. The framework, which is based on the concepts of habitat comfort, tourists' emotional dimension, and tourists' pro-environmental behavior, provides guidance and reference for

different groups of people engaged in rural tourism management and policy making. Through collaborative efforts, it is possible to achieve a positive experience for tourists, the sustainable development of scenic spots, and the prosperity of communities.

4. Conclusions and recommendations

Majority of respondents were between the ages of 27 and 42, with more women than men, and most had a college degree or higher, working in a variety of professions and 3 personnel from abroad. All four dimensions of habitat comfort improve visitors' comfort perceptions, with the natural and spatial environments being the most significant. Pro-environmental behavior has four dimensions that can increase tourists' awareness of environmental protection. Environmental citizenship is the most significant, followed by conservation lifestyle behavior. Habitat comfort has a significant positive impact on tourists' pro-environmental behavior. This means the higher the level of emotional dimensions of tourists in the process of rural tourism, the more likely that their pro-environmental behavior will occur. A proposed framework for pro-environmental behaviors based on human comfort and emotional dimensions was developed and validated based on the results of the study. The current study recommended that attraction managers may improve habitat comfort and enhance visitors' emotional experiences by protecting wildlife, increasing spatial comfort, and fostering a connection with nature. Developing tourism products that harmonize with the local environment and culture, and encouraging pro-environmental behaviors, such as using recyclable items and sharing environmental issues on social media, create a win-win situation for tourists and scenic spots. Policymakers may support policies that enhance habitat comfort and emotional experiences for tourists by regulating environmental protection and service quality at scenic spots. Future researchers may conduct further studies to explore other variables (destination culture creation, wildlife welfare, etc.) that may affect tourists' pro-environmental behaviors, which may contribute to the success of scenic area management.

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