

Longitudinal influence of environmental interpretation of eco-tourism sites in national parks on tourists' environmental responsibility behavior

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Abstract: Ecotourism can provide tourists with good environmental education experience and improve environmental responsibility behavior. Environmental responsibility behavior includes specific environmental responsibility behavior and general environmental responsibility behavior. Taking the environmental interpretation of eco-tourism sites in national parks as an important pre-variable of environmental education function, this paper examines the relationship between environmental interpretation and specific and general environmental responsibility behaviors. The paired sample T-test of SPSS data analysis software found that: (1) Environmental interpretation of eco-tourism destinations in national parks has a positive impact on specific environmental responsibility behaviors, and has a significant positive impact on financial actions. (2) Environmental interpretation of eco-tourism sites in national parks has a positive impact on general environmental responsibility behavior. (3) The study also found that the environmental interpretation function of the national park publicity and education center was significant. This paper deeply explains the influence mechanism of environmental interpretation on specific environmental responsibility behaviors and general environmental responsibility behaviors. At the same time, it provides certain practical guidance for ecotourism destinations to further improve the function of environmental interpretation from the perspectives of knowledge and diversity of information content, means and media, and setting methods of environmental interpretation.

1. Introduction

The establishment of the national park system is a key reform task proposed by the Third Plenary Session of the 18th CPC Central Committee, and an important part of the construction of China's ecological civilization system. It is of extremely important significance for promoting the scientific protection and rational use of natural resources, promoting the construction of a beautiful China, and promoting harmonious coexistence between man and nature. A national park is a specific land or Marine area approved and managed by the state, with clear boundaries, with the main purpose of protecting a large area of natural ecosystems representative of the country, and achieving scientific protection and rational use of natural resources. On October 12, 2021, the list of China's first national parks, including the Giant Panda National Park, was officially announced. One of the main functions of the national park is to carry out scientific research, environmental education and leisure activities with restrictions under the premise of strict protection of the core area and scientific control of utilization and the number of visitors. Ecotourism, nature education and ecological experience will be the main business forms.

Ecotourism aims to promote biodiversity protection through tourism activities and environmental education,

and is an important means to build a modern power of harmonious coexistence between man and nature. In the 1980s, the concept of ecotourism was first proposed by Ceballos-Lascurain. Since then, the concept, definition and connotation of ecotourism have been continuously enriched and developed. The International Eco-tourism Association defines ecotourism as: "responsible travel to natural areas that protects the environment, maintains the well-being of local people, and includes interpretation and education" (TIES, 2015). Guo Laixi believes that ecotourism has six characteristics, such as "taking nature as the stage, ecological thought, high-intensity participation, and enhancing human environmental awareness" ^[1], and the function of environmental education has always been the core of the concept of ecotourism. Environmental education is an inherent requirement for ecotourism to play its educational function and an important means to train environmentally responsible tourists and citizens. Environmental education teaches people how to make decisions in the face of issues related to environmental quality and is the basis for the development of self-behavior (IUCN, 1970).

In the process of developing ecotourism activities, it is necessary to realize the full play of the environmental education function of ecotourism through the environmental interpretation of ecotourism

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participants. "Environmental interpretation" not only includes objective environmental interpretation information and its sources, but also includes subjective understanding of major stakeholders such as managers, experts and tourists, which is an important influencing factor on tourists' environmental responsibility behavior. In order to improve the environmental responsibility behavior of tourists participating in ecotourism actively and effectively, and give full play to the environmental education function of ecotourism, it is necessary to carry out research on tourists' environmental interpretation and environmental responsibility behavior.

By selecting national park research papers published in Chinese core journals in the past five years and using the relevant knowledge map drawn by the subjection-assisted analysis system, it is found that the relevant researches mainly focus on landscape architecture (spatial layout planning, etc.)^[2-4], biodiversity^[5-6], and ecosystem services^[7-8]. Studies on ecotourism^[9-11] account for a small proportion, and mostly focus on development paths, environmental protection, and ecological civilization construction. In general, there is relatively little research on environmental education function of national parks in China. Therefore, this paper attempts to study the longitudinal impact of tourists' environmental responsibility behavior from the perspective of environmental interpretation of eco-tourism destinations in national parks.

2. Theoretical basis and research hypothesis

"Pro-environmental responsible behavior is a behavior that is generally (or according to environmental scientific knowledge) judged in the social context under consideration as a way to protect environmental behavior or as a contribution to environmental health"^[12], Krajhanzl (2010) argues, Actions such as environmentally responsible behavior, environmentally sustainable behavior, environmental protection behavior, ecological behavior^[13-14], and environmentally responsible behavior are often used as equivalents of pro-environmentally responsible behavior. At present, the academic research on "environmental responsibility behavior", especially in the context of eco-tourism, can be generally divided into two space-time categories, namely "specific environmental responsibility behavior" and "general environmental responsibility behavior" mentioned in this paper.

2.1. Specific environmental responsibility behavior

As for specific environmental responsibility behaviors, scholars mainly study a series of environmental responsibility behaviors of visitors in the process of tourism. Specifically, it refers to a series of behaviors implemented by tourists in the process of tourism to reduce the environmental impact (the wildlife tourism mentioned here refers to the wildlife tourism based on

the principles of ecotourism, referred to as "wildlife tourism"). Vaske et al. defined the environmental responsibility behavior at the tourist destination as the site-specific environmental responsibility behavior, believing that the events at a specific location will affect the environmental responsibility behavior at a specific location^[15]. Smith et al proposed that specific environmental responsibility behavior can refer to actions that are beneficial to the environment in a specific place^[16]. Lee divided site-specific environmental responsibility behavior into three levels: sustainable action, pro-environment action and environment-friendly action^[17].

This paper holds that the specific environmental responsibility behavior is the direct or indirect behavior taken by tourists to promote the local environmental protection in the tourist destination, including the behavior before and after the tourists accept the environmental interpretation.

2.2. General environmental responsibility behavior

General environmental responsibility behavior usually occurs in the daily life of tourists and represents the environmental responsibility behavior of individuals in daily life^[18]. Including reducing waste of resources, participating in environmental voluntary activities, donating to environmental public welfare organizations and other specific practices. Smith-Sebasto and D 'Costa (1995) proposed that environmentally responsible behavior includes educational action, civil action, financial action, legal action, physical action and persuasive action^[19]. Kaiser and Wilson (2004) also proposed that ecological behavior should include energy saving, travel and transportation, waste avoidance, consumerism, recycling, substitution and social behaviors related to conservation^[20].

Different from the specific environmental responsibility behavior, the general environmental responsibility behavior mainly refers to the collection of behaviors that occur in daily life and are beneficial to environmental protection, and its occurrence time, involvement field and influence degree are more far-reaching.

2.3. Research hypothesis

According to Interpretation Australia's (2011) definition of environmental interpretation and current scholars' cognition of the functions and effects of environmental interpretation, it is considered that environmental interpretation is an important factor affecting tourists' knowledge, awareness and on-site behavior^[21, 22-23]. It is the most basic and key pre-variable to realize the function of eco-tourism environmental education. As a subset of transformative tourism, ecotourism also meets Phillips' (2019) definition of transformative tourism: "tourism that places an individual in a new environment, forcing him or her to develop new resources and respond creatively to challenging situations, ultimately" adjusting

"views, behaviors, lifestyles, and relationships with the world that are taken for granted."^[24] Therefore, the interpretation of eco-tourism environment may change tourists' behaviors, including specific environmental responsibility behaviors during tourism and general environmental responsibility behaviors in daily life.

Therefore, this paper proposes the following hypothesis:

H1:Environmental interpretation has a positive impact on specific environmental responsibility behaviors

H2:Environmental interpretation has a positive impact on general environmental responsibility behavior

3. Research design

This study adopts the quantitative research method, mainly collects quantitative materials through two forms of scale and questionnaire, and collects data on environmental interpretation, specific environmental responsibility behavior and general environmental responsibility behavior, so as to confirm whether there is a positive impact relationship between environmental interpretation, specific environmental responsibility behavior and general environmental responsibility behavior and whether the impact is significant.Compared with traditional pre - and post-test methods, retrospective-pre ^[25] is considered to be a more accurate method to obtain pre-tour data of tourists. This study adopts retrospective pre - test to collect pre-tour environmental responsibility behavior data.In order to facilitate statistical analysis, the questionnaire and scale all adopted five-level Likert scale, that is, five options were set, strongly disagree, relatively disagree, uncertain, relatively agree and strongly agree, and 1-5 points were assigned in turn.

3.1. Questionnaire and scale design

3.1.1. Environmental interpretation questionnaire

Due to the lack of relevant research on environmental interpretation, the concept of environmental interpretation is still unclear.In view of this, this study defines the environmental interpretation of eco-tourism destinations as: taking environmental protection as the ultimate goal, environmental interpretation is the sum of environmental education information that eco-tourism destinations act on tourists.In order to maximize the function of environmental interpretation, environmental interpretation should be based on comprehensive consideration of the characteristics of the interpretation information and the characteristics of the interpretation media, and through appropriate interpretation skills, the interpretation information should be efficiently conveyed to tourists.Based on the definition of environmental interpretation, combined with the existing main defects of environmental interpretation, and referring to the classification of environmental interpretation by Zhang Jianping (2017) ^[26], the service quality model of environmental interpretation system proposed by Zhu

Liang et al. (2012) ^[23], and the evaluation model of environmental education resources constructed by Shang Xiaoli et al. (2020) ^[27],As well as relevant studies on tourists' environmental responsibility behavior ^[28, 29-30, 23], three dimensions of environmental interpretation questionnaire were identified:In terms of the knowledge and diversity of information content, means and media, and setting skills, there are 18 items, including "During the tour, I saw the science popularization information of the national park" and "During the tour, I obtained relevant information through comprehensive venues such as the science popularization and Education Center (museum) and the biodiversity Experience Museum".

3.1.2. Specific environmental Responsibility Behavior Scale

Combined with the studies of Kaiser et al. ^[31], Lee et al. (2013,2019) ^[32-33] Huang Jingbo et al. (2017) ^[34] and Hong Xueting et al. (2018) ^[35], the scale of specific environmental responsibility behavior includes 15 items including educational action, financial action, physical action and persuasive action.For example, "I will pay attention to the environmental protection information of the tourist destination, such as the relevant information on the sign board and the guide book", "I will not buy wild herbs and wild vegetables dug by local farmers", "I will try not to go to areas that may have an impact on wildlife", "I will tell my companions not to feed wild animals during the tour", etc.

3.1.3. General Environmental Responsibility Behavior Scale

The general environmental responsibility behavior scale refers to the studies of Lee et al. ^[32-33] and Smith-Sebasto et al. ^[19], combined with the specific reality of national parks, the scale dimension refers to specific environmental responsibility behavior, and measures 16 items including educational action, financial action, physical action and persuasive action.These include "I will read magazines and books on environmental protection," "I will not buy wildlife products," and "I will turn off the faucet when I wash dishes (brush my teeth) to save water."

3.2. Data collection

All questionnaires and scales are distributed offline.In the process of field investigation, considering the accessibility of the case site and the convenience of data acquisition, I conducted a survey in the Qingping entrance community in Deyang Area of Giant Panda National Park in November and December 2023.Since 2017, in order to further practice the "two mountains" theory, Qingping Town has transformed from the four major phosphate rock bases in China into a well-known tourism "fairy town". It has a certain tourism service facility foundation, which can guarantee the data volume of this study.In addition, in October 2020, the Giant Panda National Park Qingping Entrance demonstration

community was officially unveiled, the relationship between Qingping town and the national park is becoming closer, the Giant Panda National Park (Mianzhu area) science popularization and education center was also completed here, and the town was also named the forest nature education base in Sichuan Province. In this way, Qingping Town has a certain basis for the interpretation of ecotourism environment, which is more in line with the case site standard of this study. A total of 66 questionnaires were sent out, and problematic data such as partial missing values were excluded. This paper conducted research based on 50 valid questionnaires.

4. Data analysis

This paper mainly uses SPSS data analysis software. Firstly, reliability analysis was used to test the reliability of environmental interpretation and environmental responsibility behavior data before and after the tour. Then, the efficiency of environmental interpretation is evaluated comprehensively by means of the mean value of environmental interpretation, which is used to analyze the important elements of environmental interpretation that act on environmental responsibility behavior. Then, the paired sample T test was used to verify whether there were differences in specific and general environmental responsibility behaviors before and after the tour, and whether the differences were significant.

4.1. Reliability analysis

This study mainly used Cronbach's α coefficient for scale reliability analysis. After calculation, it was found that the Cronbach's α coefficient of environmental interpretation questionnaire, pre-tour specific environmental responsibility behavior scale, pre-tour general environmental responsibility behavior scale, post-tour specific environmental responsibility behavior scale and post-tour general environmental responsibility behavior scale were 0.903, 0.901, 0.930, 0.936 and 0.964, respectively. All of them are greater than 0.9, with high internal consistency, indicating that the scale designed in this study has good reliability and can be used for subsequent empirical analysis.

4.2. Environmental interpretation questionnaire analysis

According to the statistical results, for the three modules of the environmental interpretation questionnaire, the average value of the knowledge and diversity items of the environmental interpretation information content is 4.460, the average value of the means and media items is 4.309, the average value of the setting skills items is 4.067, and the average value of the total items is 4.270. The average value is generally between relatively satisfied and very satisfied. It can be seen that the interpretation content of scientific and ecological knowledge in the interpretation system of domestic

eco-tourism environment is not rich enough; The participation, experience and interest of environmental interpretation products are not strong; Problems such as insufficient use of multimedia interpretation system [6-7] have been significantly improved, and the effectiveness of environmental interpretation has been improved. Among them, 13 questions "I cannot fully understand the information content due to too many professional terms in interpreting the information" were reversed, with an average of 3.60, indicating that tourists generally believed that the professionalism of the interpretation of the information in the case did not have a significant negative impact on the understanding level. The mean values of other items are all greater than 4.0, indicating that respondents are satisfied with the environmental interpretation system in this place. During the tour, I saw the warning information related to the protection of wildlife "and" during the tour, I saw the advocacy slogans and prompt information related to the protection of the environment ". The average values of the items were respectively 4.60 and 4.50, which were the highest values of the average values. It can be seen that, Tourists are more satisfied with the warning information related to local wildlife protection and the advocacy slogans and tips related to environmental protection.

4.3. Paired sample T-test

According to the histogram test with normal curve, the data of the specific environmental responsibility behavior scale and the general environmental responsibility behavior scale before and after the tour basically conform to the normal distribution, and the paired sample T-test can be used.

4.3.1. Paired sample T-test for specific environmental responsibility behaviors

item	Pre-trip mean	Post-trip mean	paired sample T-test		
			Mean before - after	t	Sig. (Double tail)
Educational action					
1.I will pay attention to the environmental protection information of the tourist destination, such as the relevant information on the sign board and the guide book	4.40	4.52	-0.120	-1.231	0.224
2.I would like to listen to environmental explanations from tour guides, electronic guides, promotional videos and other interpretation systems of tourist destinations	4.38	4.54	-0.160	-1.661	0.103
3.I pay attention to information about environmental education places in tourist destinations, such as publicity and education centers and science popularization centers	4.24	4.48	-0.240	-2.201	0.032
Financial action					
4.For environmental reasons, I would not buy or use instant noodles in buckets in tourist destinations	3.80	4.42	-0.620	-3.969	0.000
5.I don't buy the wild herbs and vegetables from local farmers	3.60	4.40	-0.800	-4.733	0.000
6.I wouldn't eat wildlife in a tourist destination	4.42	4.64	-0.220	-2.112	0.040
7.I'm willing to pay a little more than market price for local, eco-friendly products	3.74	4.24	-0.500	-2.602	0.012
Physical action					
8.I will take the initiative to do a good job of garbage sorting in tourist destinations	4.50	4.58	-0.080	-0.893	0.376
9.I will abide by the tourist code of conduct of the destination	4.80	4.76	0.040	0.573	0.569
10.I try not to go to areas that might have an impact on wildlife	4.76	4.76	0.000	0	1.000
11.I try not to use disposable travel items such as slippers and face towels	4.22	4.54	-0.320	-3.055	0.004
Persuasion action					
12. During the travel, I will encourage others to separate their garbage	4.20	4.42	-0.220	-2.037	0.047
13. In the process of traveling, I will take the initiative to persuade others when I find violations of relevant regulations on environmental protection in the tourist destination	4.20	4.48	-0.280	-2.714	0.009
14. During the tour, I will tell my companions not to disturb wild animals, including loud noise, feeding and other behaviors	4.50	4.64	-0.140	-1.632	0.109
15. During the tour, I will try my best to encourage my companions not to use disposable items, including disposable chopsticks and slippers	4.28	4.48	-0.200	-1.807	0.077

Figure 1. Paired sample T-test for specific environmental responsibility behaviors

The data of specific environmental responsibility behaviors show that the T-values of the educational actions, financial actions, physical actions and persuasive actions of 50 tourists before and after their visit are all

negative (as shown in Figure 1), indicating that the environmental interpretation of national parks does have a positive impact on tourists' specific environmental responsibility behaviors. Specifically, in terms of educational actions, the Sig. (double-tail) test value of "I pay attention to the information of environmental education places in tourist destinations, such as publicity and education centers and science popularization centers" is 0.032, indicating that tourists have significantly increased access to science popularization information in science popularization venues such as mission and education centers. In terms of financial actions, "from an environmental perspective, I will not buy or use instant noodles in buckets in tourist destinations" "I will not buy wild herbs and wild vegetables dug by local farmers" "I will not eat game in tourist destinations" "I am willing to buy local eco-friendly products that are slightly higher than the market price" the four options Sig. (double-tail) test values are 0.000, 0.000, 0.040 and 0.012 respectively. It shows that environmental interpretation has a significant positive impact on financial actions. Among them, the purchase of instant noodles, the purchase of wild herbs and wild vegetables by farmers are the most significant. In terms of physical activity, "I try not to use disposable travel items, such as slippers and face towels" Sig. (two-tail) test value was 0.004, indicating a significant reduction in the use of disposable travel items. In terms of persuasion actions, "I will encourage others to sort and dispose of garbage in the process of tourism" and "I will take the initiative to persuade others when I find violations of relevant regulations on environmental protection in the tourist destination during tourism" Sig. (double-tail) test values are 0.047 and 0.009, which are statistically significant differences. It indicates that tourists are more inclined to take persuasive actions in two cases: garbage sorting and violation of environmental protection regulations in tourist destinations.

4.3.2. General environmental responsibility behavior paired sample T test

item	Pre-visit mean	Post-visit mean	Mean before - after	t	Sig. (Double tail)
Educational action					
1. I read magazines and books about environmental protection	4.26	4.50	-0.240	-2.281	0.027
2. I watch TV programs about environmental protection	4.34	4.52	-0.180	-2.024	0.048
3. I will pay attention to videos and articles about environmental protection on new media platforms, including but not limited to Wechat and Tiktok	4.38	4.44	-0.060	-0.622	0.537
4. I talk about environmental issues with others	4.36	4.44	-0.080	-0.893	0.376
Financial action					
5. I will donate money to support an environmental organization, such as Tencent's Common Guardian of Endangered Species donation project	4.14	4.36	-0.220	-2.937	0.047
6. I will pay attention to whether the product is green, energy-saving and environmental protection when choosing the product	4.42	4.54	-0.120	-1.231	0.224
7. I buy products with simple packaging, or packaging that can be reused and recycled	4.36	4.56	-0.200	-2.111	0.040
8. I don't buy wildlife products	4.62	4.74	-0.120	-1.062	0.293
Physical action					
9. I turn off the tap when I do the dishes (brush my teeth) to save water	4.70	4.74	-0.040	-0.496	0.622
10. If I'm out of the room for a long time (say more than 10 minutes), I turn off the lights	4.68	4.72	-0.040	-0.496	0.622
11. I often bring my own eco-friendly shopping bags or reuse plastic shopping bags when I go shopping	4.56	4.64	-0.080	-1.159	0.252
12. I often travel low-carbon, taking public transportation as much as possible, riding bicycles, taking taxi cabs, etc.	4.48	4.70	-0.220	-2.400	0.020
Persuasion action					
13. I will persuade my friends and relatives to avoid buying overly packaged products	4.28	4.50	-0.220	-2.196	0.033
14. I will persuade my friends and relatives to avoid using disposable items, such as disposable chopsticks	4.18	4.40	-0.220	-2.037	0.047
15. I persuade friends and relatives to conserve water by, for example, not running the tap when brushing or shaving, and/or installing water-saving devices in his/her toilet tank	4.46	4.58	-0.120	-0.973	0.335
16. I will persuade my friends and relatives to travel low-carbon, such as cycling, public transport, taxi carpooling as much as possible, etc.	4.36	4.54	-0.180	-1.927	0.060

Figure 2. Paired sample T-test for general environmental responsibility behavior

The paired sample T-test for general environmental responsibility behavior found that the T-value of tourists before and after visiting was also negative (as shown in Figure 2). Environmental interpretation of national parks

has a positive impact on educational actions, financial actions, physical actions and persuasive actions. From the perspective of education, "I read magazines and books on environmental protection" and "I watch TV programs on environmental protection" were 0.027 and 0.048 respectively. It can be inferred that under the role of the environmental interpretation system of national parks, tourists are more likely to pay attention to environmental protection through books, television and other channels in daily life. In terms of financial actions, "I will donate money to support an environmental protection organization, such as the Common Guardian of Endangered Species donation project of Tencent Public Welfare" and "I will buy goods with simple packaging, or the packaging can be reused and recycled" Sig. (double-tail) test values are 0.047 and 0.040 respectively. It can be seen that tourists are beginning to support environmental causes from a financial perspective. In terms of physical action, "I often travel low-carbon, try to take public transportation, or ride bicycles, taxi carpooling, etc." Sig. (two-tail) test value is 0.020. In terms of persuasion actions, "I will persuade my friends and relatives to avoid buying over-packaged products" and "I will persuade my friends and relatives to avoid using disposable daily necessities as much as possible, such as disposable chopsticks" Sig. (double-tail) test values were 0.033 and 0.047, respectively, with statistically significant differences. And it is consistent with the behavior analysis of disposable products in specific environmental responsibility behavior.

5. Conclusion

The knowledge and diversity, means and media, and setting skills of environmental interpretation information in Qingping Town have been affirmed by tourists, and at the same time, they have a positive impact on tourists' environmental responsibility behavior. As a demonstration community at the entrance of the Giant Panda National Park, Qingping Town has certain advantages in environmental interpretation resources. At present, the environmental interpretation system of Qingping town mainly relies on the science popularization and education center of Giant Panda National Park (Mianzhu District) and the tourism service center of Qingping Town. Mianzhu Science Popularization Education Center was built in 2021, with the main content of science popularization knowledge such as geology and geomorphology of Deyang Area of Giant Panda National Park and giant panda protection, using various interpretation methods such as geological and geomorphological sand table, ore physical display, animal growth video explanation, cute panda group photo, etc., to make full use of fun, experience and aesthetic skills to interpret the environment to visitors. The tourism Service center of Qingping Town mainly interprets the green transformation and development of the mining town, and introduces in detail the transformation road of the closure of mining rights, the ecological restoration of mines and the development of rural tourism by means of video explanation, text

display and personnel explanation, so as to focus on the local ecological civilization construction practice for tourists. In summary, the environmental interpretation information of Qingping Giant Panda National Park is diverse in content and abundant in interpretation means, which is an important prerequisite for better play of environmental interpretation function. This conclusion is consistent with the research conclusion of Huang Jingbo et al. [34] that environmental knowledge is an important influencing factor of environmentally friendly behavior.

The environmental interpretation of eco-tourism sites in national parks has a positive impact on the specific environmental responsibility behaviors of tourists. First, tourists' acceptance of the interpretation of the mission and education center has been significantly improved, which is consistent with the conclusion of Hong Xueting et al. [35]. However, the impact on the acceptance of environmental interpretation media such as signs, paper prints and promotional videos is not significant. The reasons behind this phenomenon may come from: first, the impact of unbalanced development of the case environment interpretation system. This is consistent with the conclusion of Shang Xiaoli et al. that the environmental education system is not perfect [27-28]. The environmental interpretation system of Qingping entrance community is still not perfect, and the environmental interpretation function is concentrated in the science popularization and education center and the tourism service center, which may lead to tourists' one-sided cognition of the environmental interpretation carrier, believing that the science popularization and education center is the most convenient and reliable place to obtain science popularization information. Second, the interpretation of the environment of the mission center is diversified. Located in the entrance community of Qingping Town, the mission Center integrates video explanation, physical display, interactive experience and other forms of interpretation, which conforms to the preferences of different groups. Second, when it comes to environment-related purchasing behaviors, environmental interpretation has prompted a clear tendency toward environmental protection. It may be due to the fact that the purchase objects measured by the scale are relatively common in the tour process, and at the same time, it will not bring large economic losses to everyone. Third, environmental interpretation has little influence on the four physical action indicators. Among them, the mean value of "I will abide by the tourist behavior norms of the tourist destination" decreased slightly compared with that before visiting, while the mean value of "I will try not to go to areas that may have an impact on wildlife" did not change. The reasons behind this may come from: one may be the influence of tourists' curiosity psychology. The unique ecological environment and high landscape value of national parks are attractive to tourists, which may lead them to choose to ignore some restrictive rules. Both may be influenced by the current level of development of national parks. The construction of China's national park system is still in the exploratory stage, and the general control area of the giant panda National Park where the case is located has

not been opened, so there are no practical conditions for many physical tourists to practice. Fourth, environmental interpretation has a significant effect on persuading friends to protect the environment. For example, persuading garbage to be separated and environmental regulations to be observed.

Environmental interpretation of eco-tourism sites in national parks has a positive impact on tourists' general environmental responsibility behavior. First of all, environmental interpretation significantly affects the environmental behavior of tourists in their daily life. For example, more attention will be paid to environmental information through magazines and TV programs. But it is not likely to pay more attention to environmental protection on new media platforms. It may be because: first, the recognition of environmental information acquisition channels. Since the 18th National Congress of the Communist Party of China, the construction of ecological civilization has been raised to an unprecedented height, and the amount of environmental protection information published by traditional media such as television and books has significantly increased, and people have a higher degree of recognition of environmental protection information obtained through these channels. The second is the positioning of entertainment functions on new media platforms such as wechat and Douyin. In daily life, people are more inclined to entertain and relax through new media, rather than collect some professional information. Secondly, for small habits in daily life, such as saving water and electricity, and bringing environmental protection shopping bags, respondents' behaviors or behavioral intentions are not significant, which may be because the force of habits leads to greater resistance to change. Moreover, under the influence of environmental interpretation of eco-tourism destinations, tourists generally expressed their willingness to persuade their relatives and friends to jointly practice environmental protection behaviors, which is inconsistent with the opinion that the difficulty coefficient of persuasion is relatively high [35]. This may be because the data collected in this study belong to behavioral intention during the tour, and the specific degree of practice cannot be predicted.

6. Management enlightenment

First, environmental interpretation has obvious improvement effect on tourists' environmental responsibility behavior. Eco-tourism destinations should build a perfect environment interpretation system, start from the knowledge and diversity of environmental interpretation information content, means and media, setting skills and other aspects, comprehensively improve the environmental education function, improve tourists' environmental responsibility behavior, and build a harmonious coexistence and modernization between man and nature.

Second, ecotourism destinations should pay attention to the high-quality development of ecological industries. The good play of environmental education can

bring tourists' obvious preference for eco-friendly products in eco-tourism destinations. It is necessary to accelerate the development of ecological industries, improve the ecological value of agricultural products, and promote the positive transformation of the ecological value of green products.

Third, eco-tourism destinations should strengthen the supervision of tourist behavior. Most eco-tourism destinations are located in areas with beautiful scenery, unique natural resources and fragile ecology, and tourists are prone to violate ecological protection norms out of curiosity. Therefore, managers should strengthen supervision and give full play to the role of environmental interpretation in behavioral regulation.

Since this study mainly uses questionnaires and scales to collect data, it is difficult to make corresponding analysis on the improvement effectiveness of environmental responsibility behaviors of different information contents and interpretation methods, and there are certain limitations. I hope to have the opportunity to conduct interview research based on this in the future, and specifically analyze the environmental education functions of different environmental interpretation factors.

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