An Analysis of the Relationship between Environmental Attitudes and Behavior Intention of Tourists in Natural Heritage Sites: A Case Study of Tourists in Jiuzhaigou National Park

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Abstract: This paper focuses on the environmental attitudes and behavior intentions of tourists which are believed to be essential for the tourism development of natural heritage sites. Research data was collected through tourist surveys in Jiuzhaigou. Exploratory factor analysis suggests that the environmental attitudes of tourists can be categorized into four dimensions, namely, environmental affection, environmental responsibility, environmental knowledge and environmental morality. Environmental responsibility reflects tourists’ attitudes towards environmental protection against tourism exploitation and development. Estimation results of structural equation model show that there is a relationship between various dimensions of environmental attitudes and behavior intentions. Generally, environmental affection and knowledge have significant and positive influences on environmental behavior intention of tourists; environmental morality also has a significant influence, although lesser in magnitude; and environmental responsibility showed no significant influence on tourists' environmental behavior intention.

Keywords: environmental attitudes, environmental behavior intention, structural equation model, Jiuzhaigou
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INTRODUCTION

The fast-paced growth of tourism is accompanied by the people's increasing awareness of environmental problems associated with the tourism industry. The sustainable development of natural heritage sites does not only depend on the measures taken by the government and administrative units, but is also based on the environmental attitudes and behavior of tourists during their visits (Junquera et al., 2001). This paper focuses on the environmental attitudes and behavior intentions of tourists which are believed to be essential for tourism development of natural heritage sites.

Since the 1990s, increasing attention has been given to the theoretical and empirical research on environmental attitudes and behavior (Tarrant and Green, 1999). After a review of relevant literature, it was found that many research works on tourist environmental attitudes exist, including the potential factors of environmental attitudes, the relationship between environmental attitudes and other behaviors, and the concept and measures of environmental attitudes. Ewert et al. (2005) investigated the effects of early-life experiences (e.g., positive indoor and outdoor recreation activities, the media, and negative environmental events) to an individual's environmental beliefs. Using the multi-dimensional scaling, Hashimoto (2005) studied how people in the tourism industry perceive the natural environment, as well as the responsibilities involved in environmental management; results showed that cultural differences were important determinants of environmental attitudes. Lee and Moscardo (2005) demonstrated that awareness of in-resort environmental practices and satisfying experiences in ecotourism destinations could reinforce a visitors' favorable attitude towards the environment. Bjerke et al. (2006) investigated the relationship between environmental attitudes and outdoor recreation interests. In this study, environmental attitudes were measured using a shortened version of the New Ecological Paradigm (NEP) scale. The study suggested that significant differences in environmental attitudes exist between appreciative and consumptive tourists. In Hudson and Richie’s (2004) research, there is a strong correlation between the tourists’ willingness-to-pay for environmentally-friendly skiing products and the cost of the holiday activity, as well as between level of income and level of environmental conscience.

However, to the authors’ best knowledge, research on environmental attitudes and behavior intention is still lacking in China. While foreign papers offer studies on the relationship between environmental attitudes and behavior, their results and implications cannot be applied to China’s situation because of the societal and cultural differences. This study, therefore, attempts to address the abovementioned points, making our study one of the first attempts to examine this issue. The structural equation model (SEM) is used to extract distinct features of environmental attitudes by tourists apart from the effect of Western tourists on a natural heritage site. This paper also aims to investigate the potential relationship of environmental attitudes and behavior intention of tourists on Jiuzhaigou, a world-famed natural heritage site.
METHOD

Data Issues

The case study focuses on the tourists of Jiuzhaigou, a natural heritage site located in Sichuan Province. As a popular tourist destination, people have paid significant attention to the environmental problems encountered by the natural heritage site during its development, as mandated by China’s tourism industry. Research data were collected through tourist surveys conducted in April to May 2008. A total of 600 questionnaires were distributed; of these, 585 valid questionnaires were obtained.

The questionnaire contains eleven environmental attitude items and three environmental behavior items. The items in the questionnaire were designed based on a five-point Likert scale to reflect the respondent's level of agreement or disagreement (1—strongly opposed, 2—opposed, 3—indifferent, 4—agree, and 5—strongly agree). The data set was analyzed using SPSS 12.0 statistical analysis software. By excluding missing values in the sample, a final set of 389 valid samples were retained for formal analysis. To verify their reliability, Cronbach’s alpha was calculated, the result of which indicates a robust alpha of 0.793, indicating good internal consistency within the data set.

Method

In order to investigate the potential relationship between environmental attitudes and behavior intention of tourists in Jiuzhaigou, this research conducted a three-step approach to analyze the SEM. First, the exploratory factor analysis (EFA) was employed to derive the underlying dimensions of the tourists’ environmental attitude and behavior intention. Second, theoretical model and hypotheses were forwarded based on the results of EFA and previous findings. Finally, the structural equation model was estimated using the latent variable from confirmatory factor analysis (CFA), and the hypotheses were tested.

SEM is a model that combines confirmatory factor analysis and regression analysis, in which the relationship between manifest variables and latent variables, as well as the relationship across latent variables, can be estimated. The advantages for using SEM include the following: (1) several dependent variables can be handled at the same time; (2) measurement error is allowed in the independent variables; (3) a latent variable can be constructed by several measurement variables; and (4) the relationship between latent variables can be defined by researchers, thus allowing model estimation and fit index calculation.

Exploratory Factor Analysis

No clear definition of “environmental attitude” exists to date. This concept has always been regarded as being similar to or is covered by the concept of environmental consciousness, environmental awareness, and environmental affection. In the 1970s, Piaget, a Swiss psychologist, suggested that attitudes could be divided into three parts: affection, perception, and ability. In the 1990s, Webber demonstrated that attitudes were composed of belief, affection, and behavior. Moreover, Kaiser et al. (1999) divided environmental attitudes into three dimensions:
environmental knowledge, environmental values, and ecological behavior intention. Meanwhile, according to Lu et al. (2004), environmental attitudes incorporate four dimensions: environmental protection, environmental resource, environmental study, and environmental sustainability.

In this paper, exploratory factor analysis is used to establish the structure of environmental attitudes. Principal component analysis with varimax rotation was adopted for EFA. A range of cutoff criteria is used to determine the number of factors derived, such as percentage of variance and factor loadings. Items with loading lower than 0.4 were eliminated. A four-factor solution with 11 manifest variables was chosen. These four factors represent approximately 70.37% of the total variance (Table 1).

EFA allows us to further categorize tourists’ environmental attitudes into four dimensions, namely, environmental affection, environmental responsibility, environmental knowledge, and environmental morality. The environmental responsibility dimension reflects tourists’ attitudes toward the responsibility of environmental protection against tourism exploitation and development. Compared to other dimensions, this has not been studied in previous research. The environmental knowledge dimension reflects tourists’ knowledge about the natural environment. Environmental morality demonstrates the moral level of tourists’ attitudes to the natural environment. These four factors are used as indicators for the latent constructs of “environmental attitude” in the subsequent SEM analysis.
Table 1: Results of EFA on tourists’ environmental attitudes

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factor Loadings</th>
<th>Cumulative Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Environmental Affection (ξ₁)</strong></td>
<td></td>
<td>26.94%</td>
</tr>
<tr>
<td>In ecotourism, environmental interpretation boards are important (X₁)</td>
<td>0.853</td>
<td></td>
</tr>
<tr>
<td>Protecting natural environment is an emergency (X₂)</td>
<td>0.849</td>
<td></td>
</tr>
<tr>
<td>It is hard to recover once the natural environment is damaged (X₃)</td>
<td>0.791</td>
<td></td>
</tr>
<tr>
<td>I will be angry to witness the deterioration of environment in tourism destination (X₄)</td>
<td>0.757</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 2: Environmental Responsibility (ξ₂)</strong></td>
<td></td>
<td>46.79%</td>
</tr>
<tr>
<td>Improving natural environment is the responsibility of merely government and related administrative departments (X₅)</td>
<td>0.802</td>
<td></td>
</tr>
<tr>
<td>The development of nature-based tourism is more important than environmental protection (X₆)</td>
<td>0.775</td>
<td></td>
</tr>
<tr>
<td>In order to enjoy beauty, it is necessary to build a path into the forest (X₇)</td>
<td>0.707</td>
<td></td>
</tr>
<tr>
<td>I feel sorry for the wildlife that can only survive in nature reserves (X₈)</td>
<td>0.602</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 3: Environmental Knowledge (ξ₃)</strong></td>
<td></td>
<td>60.91%</td>
</tr>
<tr>
<td>Natural resources in ecotourism destinations are vulnerable (X₉)</td>
<td>0.816</td>
<td></td>
</tr>
<tr>
<td>The opening time and number of visitors should be controlled in nature reserves (X₁₀)</td>
<td>0.760</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 4: Environmental Morality (ξ₄)</strong></td>
<td></td>
<td>70.37%</td>
</tr>
<tr>
<td>The act of destroying the environment is immoral behavior (X₁₁)</td>
<td>0.964</td>
<td></td>
</tr>
</tbody>
</table>

In the review of literature, there is no standard term for “environmental behavior” in the various fields of research. For example, Kaiser et al. (1999) referred to it as “ecological behavior”, while Stern (2000) referred to it as “environmental significant behavior”. Poortinga et al. (2004) may have introduced the term, “environmental behavior”. Although the literal meanings are different, the inherent meanings of these terms are similar, as they all refer to behavior involved in solving environmental problems and protecting the environment.

The same EFA procedure is used to extract the factors from the three items under tourists’ environmental behavior intention. However, only one factor is contracted to stand for tourists’ positive environmental behavior intention (Table 2). This factor is also used as an indicator for the latent construction of “environmental behavior intention” in the subsequent SEM analysis.

Table 2: Results of EFA on tourists’ environmental behavior intentions

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor Loadings</th>
<th>Cumulative Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1: Environmental behavior intention (η)</strong></td>
<td></td>
<td>77.04%</td>
</tr>
<tr>
<td>I will try not to disturb the wildlife in nature reserves (Y₁)</td>
<td>0.897</td>
<td></td>
</tr>
<tr>
<td>I will handle the wasters produced in travel appropriately (Y₂)</td>
<td>0.910</td>
<td></td>
</tr>
<tr>
<td>I will try to discourage other tourists from damaging the environment (Y₃)</td>
<td>0.824</td>
<td></td>
</tr>
</tbody>
</table>
THEORETICAL MODEL AND HYPOTHESES

According to traditional psychological theory, general cognition may influence a person’s behavior. Hence, a great body of work has been carried out on the relationship between environmental attitudes and behavior. Ajzen’s (1991) classic theory of planned behavior states that the more positive attitude one possesses, and the greater drive from the standard environment that one perceives, the more inclination there will be for a person to take action. Guagnanod et al. (1995) found that environmental behavior is the result of both the individual’s environmental attitudes and affection factors, suggesting that while the relationship of behavior with affection factors tends to be moderate, its relationship with attitudes is strong. Hines et al. (1986) established a model of responsible environmental behavior, which suggests that environmental behavior is influenced by behavior intention, and that environmental behavior intention is influenced by skill and knowledge on environmental problems. Kaiser et al. (1999) demonstrated that environmental knowledge and values have an influence on environmental behavior intention, which also impacts environmental behavior.

Based on the literature above, this paper establishes a theoretical model to show the relationship between environmental attitudes and environmental behavior intention. In this model, five latent variables and fourteen measurement variables are used (Figure 1).

![Diagram of Theoretical Model](image)

**Figure 1:** Theoretic model of tourists’ environmental attitudes and behavior intention

Based on the theoretical model and the literature, four hypotheses are offered for empirical study.

**H1:** Tourists’ environmental affection has direct and positive influences on environmental behavior intention.

Although previous research has verified that individual’s environmental behavior is affected by affection factors (Guagnanod et al. 1995), the dimension of environmental affection in this paper is measured by a new variable set that focuses on domestic tourists in China. Thus, relevant
results need to be further verified.

**H$_3$: There is a positive association between environmental responsibility and environmental behavior intention.**

This hypothesis indicates that the more responsible the individual feels about environmental protection for the tourism destination, the more likely he/she will be environment-friendly. Compared to others, this dimension (first referred in previous literature) and its influence needs to be further verified with empirical analysis.

**H$_4$: The environmental knowledge of tourists has positive effects on environmental behavior intention.**

Hines et al.’s (1986) suggested that environmental behavior intention is influenced by knowledge on environmental problems. Although there are some studies that focus on the assessment of the tourism administrators’ environmental knowledge (Liu, 2008; Yang, 2006), relevant study on the relationship between environmental knowledge and behavior intention is still lacking, especially in China.

**H$_5$: There is a positive association between environmental morality and environmental behavior intention.**

The environmental morality dimension reflects the value and morality cognition of tourists on the environment. This paper hypothesizes that a strong recognition on environmental morality is associated with a positive environmental behavior intention.

**RESULTS**

This study applied SEM in the testing and calculation of the proposed theoretical model. Four hypotheses were then developed based on previous findings. Different measures were used to determine the measurement model fit and overall model goodness-of-fit, as well as to identify the acceptability of the estimated model. Furthermore, path coefficients were estimated by the maximum likelihood method in order to identify the magnitude of influence of each factor.

**Measurement Model Fit**

The confirmatory factor analysis of the measurement model shows that all the standard factor loadings ranged from 0.53 to 0.86, which were above the recommended 0.4 level (Hou et al., 2004); meanwhile, all of the factor loadings were significant at the 0.01 level, indicating that all measurement variables are significantly related to their specified constructs. These verify the proposed relationship among indicators and constructs (Figure 2).
Composite reliability and construct validity were calculated to test the reliability of the measurement model. The composite reliability ranged from 0.71 to 0.87, which was above the 0.6 level, as recommended by Fornell and Larcker (1981). This indicates that there is good internal consistency within latent variables. A validity test was conducted to check the veracity and reliability of the indicators, including convergent validity and discriminate validity. Convergent validity was tested by extracting the average variance. Except “environmental responsibility”, the extracted average variance has indexes over 0.6, which suggests ideal construct validity (Table 3).

### Overall Model Fit

Overall model fit indicates the degree to which the specified indicators represent the hypothesized constructs. Since $\chi^2$ is 5.348, it failed to support the assumption that the differences of the predicted and actual models are significant. However, other indexes should also be considered to determine the acceptability of the model because it is generally accepted that the $\chi^2$ value should be used as a guide, rather than an absolute index of fit, due its sensitivity to sample size and model complexity (Anderson and Gerbing, 1982). The absolute fit index for GFI and AGFI are 0.874 and 0.822, respectively, which are near to recommended level of 0.9. The comparative fit indexes of NFI, CFI, IFI, and FRI are 0.836, 0.861, 0.862, and 0.798, respectively. These measures are similarly near the recommended level of 0.9, indicating that satisfactory statistic performance of the model. In conclusion, most indexes indicate that the goodness-of-fit of the overall model is acceptable; the whole model is significant with p value less than 0.001.

### Structural Model Parameters

The maximum likelihood method was applied to estimate the path coefficients, of which the results are presented in Figure 2. This shows that environmental affection exerts significant and

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1 $\xi_4$: Since there is only one measurement variable included in “environmental morality”, the measure error is zero while factor loading is 1.
positive influences on tourists’ environmental behavior intention; it shows the largest path coefficient at 0.58. Also, the dimension of environmental knowledge has significant and positive affects on behavior intention. The influence of environmental responsibility is not significant, but the influence of environmental morality is significant, albeit small in magnitude.

CONCLUSION

Research results have several policy and administrative implications on the management of China’s national parks. Considering that the environmental affection of tourists has direct and positive influence on environmental behavior intention, the government and tourism administrators can improve environmental protection by enhancing the affection of tourists to the natural environment. For example, Lee and Moscardo’s (2005) research showed that awareness of in-resort environmental practices and satisfying experiences in ecotourism destination can reinforce the visitors’ favorable environmental attitudes. Therefore, tourism destinations can reinforce visitors’ environmental affection by conducting effective environmental administration and providing sufficient and comprehensive environment interpretation boards.

Due to the strong association between environmental knowledge and behavior intention, it is important for national park administrators to instill environmental knowledge to tourists through various channels. Meanwhile, the government and the education system should also pay more attention to environmental education as a means to improve the people’s environmental consciousness.

As an end note, the shortcoming of this research should be emphasized: the conclusion on the
relationship between tourists’ environmental attitudes and behavior intention is arrived at based
only on a single case study. Thus, more empirical and theoretical research should be conducted in
this area.

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