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THE BEHAVIORAL FACTORS ON INFLUENCING RESPONSIBLE ENVIRONMENTAL BEHAVIOR OF ISLAND TOURISTS - A CASE STUDY OF JIBEI ISLAND IN TAIWAN PENGHU

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Abstract

The purpose of this study is to analyze the behavioral factors on influencing environmentally responsible behavior (ERB) of island tourists. The study builds models based on destination attractiveness, place attachment, satisfaction and environmental knowledge according to the relevant empirical studies, and analyzes that the above variables have the influence on ERB of island tourists. The subjects in this study are tourists of Jibei Island in Taiwan Penghu. Questionnaire survey was sent by convenient sampling in visitors center near pier. There were 306 valid replied returned. The valid questionnaires were analyzed by descriptive statistics and partial least squares (PLS). There are some findings as below. Destination attractiveness influence ERB of island tourists directly via satisfaction, place attachment, and environmental knowledge. Based on above findings, it is suggested that government and island's tour operators can raise the ERB of island tourists by enhancing the education and protection awareness of environment. And it is also suggested that researcher can explore deeply and understand other factors which can influence ERB of tourists in the future.

Keywords: Environmentally Responsible Behavior (ERB), Destination Attractiveness, Place Attachment, Satisfaction, Environmental Knowledge.

Introduction

Island tourism has developed for a long time. Many islands have also become favorable travel destinations for tourists from all over the world. And tourism industry has always been one of the island's major income (Weaver, 2006). Because island is surrounded by sea, water activities are always the highlight of island tourism. Moreover, some specific ecological environment

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and unique customs in the island have strong advantages of tourism. These make island destinations more attractive and exotic (Khadaroo & Seetanah, 2007; Scheyvens & Momsen, 2008).

Gunn (1988) indicated that destination attractiveness is a critical index of tourism development. He thought if destination attractiveness lacks attraction, it will not be able to attract tourists to travel. So, the destination attractiveness is the core of each tourist attraction. Previous studies pointed out that when tourists are attracted by the special attributes provided by tourist destinations (Borst, Miedema, Vries, Grahama, & Dongena, 2008; Lee, Huang, & Yeh, 2010), that will affect the satisfaction of travel (Hou, Lin, & Morais, 2005; Lee et al., 2010) and generate place attachment to a specific destination (Lee, 2001; Hou et al., 2005).

The psychological feelings and emotions initiated by tourists' expectations for tourism activities, actual experience, participation and interaction (Baker & Crompton, 2000). These can raise the satisfaction of tour and generate a positive combination, affective involvement, identity and attribution, then reflected in the performance of place attachment (Brown, Perkins, & Brown, 2003; Hidalgo & Hernádez, 2001).

Some studies also confirmed that tourists' satisfaction of tourist destinations will increase the place attachment of tourist destinations (Alexandris, Kouthoris, & Meligdis, 2006; Lee, Graefe, & Burns, 2007). Meantime, there will also generate a kind of environmental behavior that has the lowest influence on the natural environment in the area (Kollmuss & Agyeman, 2002), and to seek approaches to prevent or solve environmental problems. This behavior is environmental responsibility behavior (ERB) (Hsu & Roth 1998; Sivek & Hungerford, 1989). Moreover, environmental knowledge can reflect the understanding degree of the physical environment. Huang and Shih (2009) suggested that environmental knowledge is related to an understanding and concern regarding natural environments, and encourages an individual's stronger responsibility for environmental protection. Therefore, tourists learned the environmental knowledge at the destination may influence their subsequent environmental behavior.

The destination attractiveness, satisfaction, place attachment and ERB of above variables, are all the critical indicator variables in the field of tourism research and important indicator of sustainable tourism development in sightseeing areas. Moreover, the environment knowledge of tourists also has an impact on ERB. Review of past studies also found there are some analysis about above variables (Dolnicar & Leisch, 2008; Hou, Lin, & Morais, 2005; Kyle, Graefe, Manning, & Bacon, 2003; Uzzell, Pol, & Badenas, 2002; Vaske & Kobrin, 2001), but there are few studies conducted integrating these five indicators variables and establishing a sustainable tourism development model. Therefore, this paper exploring the relationship and role between these variables further will be regarded as a direction for formulating a ERB plan of island tourists in the future. Furthermore, this can provide reference to government agencies and sightseeing operators to promote the

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sustainable development of the island.

Past research results showed that having a good service in tourism destinations will positively affect tourists' satisfaction and place attachment (Alexandris, Kouthoris, & Meligdis, 2006; George & George, 2004; Hwang, Lee, & Chen, 2005; Kyle, Graefe, Manning, & Bacon, 2004). Lee and Allen (1999) found that tourists on the Myrtle Beach in United States, increased the satisfaction and then engender the place attachment after being attracted by the sunshine, beach and beach destination. Cheng, Wu, and Huang (2013) researched island sightseeing in Penghu and considered that destination attractiveness has positive effect on place attachment and indirect effects on ERB. Moreover, place attachment has positive effect on ERB. Due to tourists' understanding level to destination attractiveness will cause a fair comprehension to local environment. Besides, people's environmental knowledge is related to their behavior. Therefore, this study proposes the following hypotheses.

H1: Destination attractiveness of tourist cognition has effect on satisfaction in tourism.

H2: Tourists have the higher cognition of destination attractiveness, the stronger place attachment they have.

H3: Tourists have the higher cognition of destination attractiveness, the higher environmental knowledge they have.

In the past, the results of research all showed there is a significant positive relationship between satisfaction and place attachment (Lee, 1999; Brocato, 2006). And indicated that satisfaction is antecedents of place attachment (Fleury-Bahi, Felonneau, & Marchand, 2008; George & George, 2004; Halpenny, 2010; Hwang, Lee, & Chen, 2005; Lee, 2001; Scott & Vitardas, 2008; Stedman, 2002; Yuksel, Yuksel, & Bilim, 2010). Some findings pointed out that when tourists satisfied with tourism environment and activities which they took part in, will affect individuals' emotional or functional attachment behavior to tourism destination (Hwang et al., 2005; Kyle, Graefe, Manning, & Bacon, 2003). To enhance place identity, place dependence, combination of society and emotional attachment much more (Brocato, 2006). Some studies also considered that the more tourists satisfied with the tourism destination, the more they are willing to engage in favorite leisure activities. And then engender place attachment (Brocato, 2006; Lee, Graefe, & Burns, 2007). It's based on above literature to verify that there is an actual cause-and-effect relationship between satisfaction and place attachment. So,

H4: Satisfaction has positive effect on place attachment.

H5: Satisfaction has positive effect on ERB.

Kyle, Graefe, Manning and Bacon (2004) took Appalachian National Scenic Trail in United States as the research location and explored that place attachment has effect on the cognition of natural environment users in social and environmental conditions. The results showed that when the place identity is higher, the crowded degree and

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using impact of users to social and environmental issues also increase. This confirmed that place identity leads to ERB. Halpenny (2010) and Walker and Chapman (2003) took the tourists of Canada's National Parks as the responders. The finding found that place attachment is a strong predictor variable. And this variable can affect tourists' ERB such as picking up the garbage on the ground before you leave the place. Walker and Ryan (2008) verified that residents in State of Maine in United States have raised their willingness to support and participate in ERB such as protecting local environment, because of their high place attachment to local rural landscapes. Subsequent studies by Scannell and Gifford (2010) have also fully confirmed this point. Budmk, Thomas and Tyrrell (2009) showed that there is a significant correlation between place attachment and ERB. Gosling and Williams (2010) investigated farmers of Victoria in Australia. The result presented that nature is regarded as their origin of assets for the farmers in the area, the place attachment is high and then ERB performs better. In the past, environmental education has proved that individuals have more environmental knowledge, they concern about environment more strongly (Hines, Hungerford, & Tomera, 1987; Lyons & Breakwell, 1994). The study of behavior model of sustainable tourism for island tourists in Penghu by Cheng and Wu's (2015), which found that environmental knowledge and environmental sensitivity have a positive effect on place attachment and ERB.

H6: Place attachment has a positive effect on ERB.

H7: Environmental knowledge has a positive effect on place attachment.

H8: Environmental knowledge has a positive effect on ERB.

Based on the above analysis and discussion, the hypotheses in this study are shown in Figure 1.
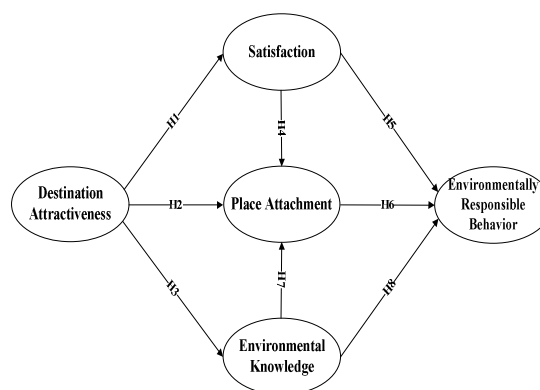

Figure. 1. Hypothetic model
Method

Research Area

Jibei Island is located in Penghu (the only outlying county in Taiwan). The size is about 3.1 square kilometers and the coastline is about 10 km long. About topography of Jibei. Xikan Mountain lies on the southwest of Jibei. Basaltic cliffs lie on the northeast of Jibei's coast. Further, there are mainly sand beaches on north, west, and south coast. Southwestern Xikan Mountain is the highest place in the island which rises 17 meters above sea level.

Subject and Sampling

The subjects of this study were tourists for sightseeing in Jibei Island. Questionnaire survey was sent by convenient sampling in visitors center near pier of Jibei Island from July 24 to 31.

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There were 350 questionnaires sent, with 320 replied returned. 14 incomplete questionnaires were removed and 306 questionnaires were valid. The effective rate of questionnaires was 87.42%.

Questionnaire

The questionnaire is divided into six parts. The first part is "Destination Attractiveness Scale", a total of 24 questions. Mainly to understand the reason of Jibei Island attracting tourists to engage in tourism and recreation activities. This scale mainly refers to the study of Penghu tourism by Chang Liao, Yang, and Chang (2015), Wu and Chang (2013, 2014) These researchers took a field trip to Jibei Island to realize real environment in the locality and then finished this study. The second part is "Place Attachment Scale", a total of 8 questions. Two factors (place identify and place dependence) are mainly to comprehend the reasons for place identify and dependence of tourists to Jibei Island. This part of the scale primarily referred to the relevant research scale of place attachment (Cheng & Wu, 2015; Williams et al., 1992). The third part is "Satisfaction Scale", a total of 5 questions. It's mainly to understand tourists' satisfaction of tourism service to Jibei Island. This part of the scale is mainly based on the related study of tourist satisfaction (Chi & Qu, 2008). The forth part is "Environmental Knowledge Scale", a total of 9 questions and 2 factors (Sustainable development knowledge and Environmental protection knowledge). The main objective is to realize tourists' increased knowledge of marine environment after traveling in Jibei Island. The scale is principally referred to the research scale of Cheng and Wu (2015). The fifth part is "Environmentally Responsible Behavior Scale", a total of 8 questions. It's to comprehend tourists' understanding and support for the sustainable development of marine environment after traveling in Jibei Island. The main reference is scale of Cheng and Wu (2015). And the sixth part is demographic variables of tourists. These consist of gender, age, marital status, occupation, education level, average monthly personal income, and numbers of visiting to Jibei Island.

Data Analysis

The valid questionnaires in this study used steps of statistical analysis as follows. 1. At first, using SPSS For Windows 21.0 analyzes the distribution of tourists' population background variables by frequency distribution and percentage of descriptive statistics. 2. Using Warp PLS 5.0 analyzes the reliability and validity of destination attractiveness, place attachment, satisfaction, environmental knowledge and ERB scale, as well as cause and effect relationship between five variables by partial least squares (PLS). In order to calculate reliability, this study calculated by composite reliability (CR) and Cronbach's α. According to Fornell and Larcker (1981) and Nunnally and Bernstein (1994), the CR and Cronbach's alpha values of .70 or more means a reliable measurement. The criterion of validity is whether factor loading of observed variables reaches value of .50. And estimating each latent variable whether it has convergent validity by average variance extracted (AVE) of each latent variable value being .50 or more (Hair, Black, Babin, & Anderson, 2010).

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Results

Respondent Profile

The great majority of the respondents were aged below 31 but over 16 (63.7%) with a slight majority of female tourists (55.9%), and most tourists are unmarried (73.7%). In all, 50.7% had a university degree or higher qualification. Service business (23.6%), student (22%) and manufacturing business (18%) were the main divisions of occupation for respondents. The great majority of the respondents had a monthly income less than NT$40,000, or approximately $1200 (61.9%), and 76.1% were first-time revisiting Jibei.

Mean, SD, Reliability and Validity Analysis of Destination Attractiveness Scale

Table 1. Result of CFA analysis of destination attractiveness scale

Latent variables	CR	Cronbach's Alpha	AVE
Seafood delicacy	.84	.75	.57
Fisheries culture	.83	.73	.56
Environmental landscape	.84	.76	.52
Water activities	.87	.78	.70
Island ecology	.85	.73	.65
Topography	.82	.72	.57

From the results of Table 1, CR of the five latent variables in the scale is above .80 and values of Cronbach's alpha is above .70. This shows the scale has a high reliability. In terms of validity, "convergent validity" is to know whether the measured variables have an enough large value to factor loading of

latent variables. And the factor loading must be more than .50. If it is less than .50, then delete this item. Factor loading of each observed variable in this study are all more than .70 from the results. AVE of each latent variable are also more than .50. This means that there is a good convergent validity.

Mean, SD, Reliability and Validity Analysis of Place Attachment Scale

Table 2. Result of CFA analysis of place attachment scale

Latent variables	CR	Cronbach's Alpha	AVE
Place dependence	.93	.90	.77
Place identity	.92	.88	.74

From the results of Table 2, CR of the two latent variables in place attachment scale is above .90 and values of Cronbach's alpha is above .90. This shows the scale has a high reliability. In terms of validity, factor loading of place attachment's observed variable are all more than .80. AVE of each latent variable are also more than .70. This means that there is a good convergent validity.

Mean, SD, Reliability and Validity Analysis of Environmental Knowledge and Satisfaction Scale

Table 3. Result of CFA analysis of environmental knowledge and satisfaction scale

Latent variables	CR	Cronbach's Alpha	AVE
Knowledge of sustainable development	.94	.91	.79
Knowledge of Environmental protection	.93	.91	.72
Satisfaction	.95	.96	.82

From the results of Table 3, CR of the two latent variables in environmental knowledge scale is above .90 and values of Cronbach's alpha is above .90. This shows the scale has a high reliability. In terms of validity, factor loading of each observed variable are all more than .80. AVE of each latent variable are also more than .70. This means that there is a good convergent validity. And in satisfaction scale, CR are all above .90 and values of Cronbach's alpha is above .90. This shows the scale has a high reliability. In terms of validity, factor loading of each observed variable are all more than .80. AVE of each latent variable are also more than .80. This means that there is a good convergent validity.

Mean, SD, Reliability and Validity Analysis of ERB Scale

Table 4..Result of CFA analysis of ERB scale

Latent variables	CR	Cronbach's Alpha	AVE
General behavior	.92	.89	.74
Special behavior	.91	.87	.73

From the results of Table 5, CR of the two latent variables in ERB scale is above .90 and values of Cronbach's alpha is above .80. This shows the scale has a high reliability. In terms of validity, factor loading of each observed variable are all more than .80. AVE of each latent variable are also more than .70. This means that there is a good convergent validity.

Structural Equation Modeling

The relationship between each latent variable of this study which adopts the detection of structural model. The

structural equation modeling (path analysis) and the results are shown in Figure 2 and Table 6. From Table 6, it can be found that the reliability and validity of all the latent variables in this study reach the ideal indicators, so we can further explain the effect relationship between the variables in the modeling.
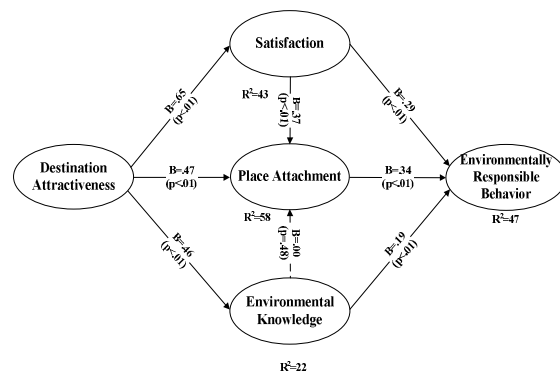

Figure 2. Structural Equation Modeling

In Figure 2, at first, island attractions have a positive effect on satisfaction (β=.65, p<.01) ,place attachment (β=.47, p<.01) and environmental knowledge. And in the part of satisfaction, the result was that it has a positive effect on place attachment (β=.37, p<.01) and ERB (β=.29, p<.01). Then place attachment has a positive effect on ERB (β=.34, p<.01). Eventually, environmental knowledge also has a positive effect on ERB (β=.19, p<.01). As a result, H8 is tenable. However, environmental knowledge has no effect on place attachment (β=.00, p>.48), so H7 isn't tenable.

Moreover, it can be found that island attractions explained 58% variance of satisfaction, 43% variance of place attachment, and 22% variance of environmental knowledge. At last is-

land attractions explained 47% variance of ERB via satisfaction, place attachment and environmental knowledge.

Conclusion and Recommendations

Conclusion

The results of the analysis show that first, tourists were attracted by island attractions (seafood delicacy, fisheries culture, environmental landscape, water activities, island ecology, topography) then visit Jibei. Because the attractions service well and fit each actual condition of attractions, their satisfaction rise and have the positive dependence and identity of Jibei. As a result, H1 and H2 are tenable. The results of this study support the past findings that having a good service in tourism destinations will positively affect tourists' satisfaction and place attachment. (Alexandris, Kouthoris, & Meligdis, 2006; Cheng, Wu, & Huang, 2013; George & George, 2004; Kyle, Graefe, Manning, & Bacon, 2004). And because of the tourists' clear understanding to island attractions and their field visit in the island, their environmental knowledge also rises significantly. Therefore, H3 is tenable.

Moreover, it was also found that tourists were very satisfied with the sightseeing tour in Jibei this time in general. As well as actual condition and service are content with their expectations. It's a wise choice and nice experience to rise their dependence and identity of Jibei. Then they engender ERB because of the above reasons. So, H4 and H5 are tenable. The above results support there is a significant positive relationship between satisfaction and place attachment (Lee, 1999; Bro-

cato, 2006). And indicate that satisfaction is a predictor of place attachment (Fleury-Bahi, Felonneau, & Marchand, 2008; George & George, 2004; Halpenny, 2010; Hwang, Lee, & Chen, 2005; Lee, 2001; Mowen, Graefe, & Virden, 1997; Scott & Vitardas, 2008; Stedman, 2002; Wickham, 2000; Yuksel, Yuksel, & Bilim, 2010). Some findings pointed out that when tourists satisfied with tourism environment and activities which they took part in, will affect individuals' emotional or functional attachment behavior to tourism destination (Hwang et al., 2005; Kyle, Graefe, Manning, & Bacon, 2003). To enhance place identity, place dependence, combination of society and emotional attachment much more (Brocato, 2006). Some studies also considered that the more tourists satisfied with the tourism destination, the more they are willing to engage in favorite leisure activities. And then engender place attachment (Brocato, 2006; Lee, 2003; Lee, Graefe, & Burns, 2007).

Tourists have the higher place attachment, the more positive ERB they have. So, H6 is tenable. The above results support that place attachment is a strong predictor variable which can affect tourists to engage in ERB (Halpenny, 2010; Kyle, Graefe, Manning & Bacon, 2004; Walker & Chapman, 2003). They also supported related results of study (Gosling & Williams, 2010; Scannell & Gifford, 2010; Walker & Ryan, 2008). Because tourists and local residents are more aware of place identity and dependence, they are more sensitive to environmental issues. They will begin to have psychology for environmental protection, and also have behavior of actual environmental protection (Budmk, Thomas

& Tyrrell, 2009; Gosling & Williams, 2010; Scannell & Gifford, 2010; Walker & Ryan, 2008).

Eventually, environmental knowledge also has a positive effect on ERB. As a result, H8 is tenable. However, environmental knowledge has no effect on place attachment, so H7 isn't tenable. The above results support the past findings that t individuals have more environmental knowledge, they concern about environment more strongly (Hines, Hungerford, & Tomera, 1987; Lyons & Breakwell, 1994). Also support the study of behavior model of sustainable tourism for island tourists in Penghu by Cheng and Wu's (2015), which found that environmental knowledge and environmental sensitivity have a positive effect on place attachment and ERB.

Based on the above discussion, the conclusions of this study are as following. 1. The stronger the influence of destination attractiveness to island tourists, the deeper their degree of satisfaction. 2. The stronger the influence of destination attractiveness to island tourists, the deeper their degree of destination attachment and degree of destination knowledge. 3. The higher satisfaction of tourism activities to island tourists, the deeper place attachment. Satisfaction reacts well, then destination will performs ERB. 4. Island tourists have place attachment of destination more deeply, they perform ERB more obviously. 5. Island tourists have environmental knowledge of destination more deeply, they perform ERB more obviously.

Recommendations

Managerial Implications.

The model built by this study shows that destination attractiveness has a significant effect on tourists' ERB via satisfaction, place attachment and environmental knowledge. Therefore, this study suggests that it should start from the enhancement and improvement of various destination attractiveness to local government tourism department in Penghu. In practice, in addition to introduction of Penghu attractiveness in each website, it's important to provide information of seafood delicacies on brochures provide by the airports, piers, attractions and visitors centers. However, we should also emphasize no wasting to use. Especially don't eat any protected marine life for reducing the need of people. Then there will not be overfishing problem.

Moreover, the brochures should explain the development of local culture of fishery industry, the hardworking cultivation of pioneer and the importance of maintaining local environmental landscape to let tourists have place identity. In addition, let tourists have place identity and dependence. Also need to inform tourists no destruction of island ecology and topography by various explanatory signs and brochures in the attraction of island ecology and topography. As for water activities, it is also necessary to have signs and brochures to inform tourists not to litter or to create rubbish, nor to destroy the environment in the beach. The above mentioned is the way of signs and brochures. In fact, tourists contact with tourism personnel the most, including airports, ports, tourists centers, hotels, B & B, souvenir shops,

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attractions docents, volunteers, workers of water activities and tour guides. When tourists contact with these people, they can show tourists local culture, ecological environment and topography. These can advance not only environmental knowledge of tourists and satisfaction of local service which let them have place identity and dependence but also the ERB of tourists.

Limitations of the Study and Directions for Future Research

In order to understand the related factors that affect tourists to engage in ERB, some limitation of the study still have to comprehend and overcome. First, from the results of the research hypothesis, it can be known environmental knowledge doesn't have direct effect on place attachment. It is worth to further verifying the correlation between two variables with other island's tourists as an example. Whether due to the different nature of the destination makes individuals behave differently. Secondly, reviewed previous studies of island tourism and found that it's minor to measure and examine together with the five latent variables in structural equation modeling of this study. It suggests that in the future this framework can be used to measure the basic modeling of the island as a tourism destination and to explore causal correlation between latent variables and ERB. It will help researchers and tourism-related managers to control the factors affecting the environmental behaviors of tourists more deeply in the future. Finally, because the survey location of this study is Jebei island as a major scope which belongs to an activity of marine recreation or sports sightseeing, it suggests that researchers can

explore tourism schedules of other attributes for breaking through this limitation in the future. For example, rural tourism, ecology tourism, cultural tourism and other forms of tourism. It can measure the effects of ERB which tourists perform and then analyze and verify it with the similar research methods.

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