

The influence of place attachment on the relationship between destination attractiveness and environmentally responsible behavior for island tourism in Penghu, Taiwan

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This study examines the causal relationships between place attachment, destination attractiveness and environmentally responsible behavior (ERB), and the mediating effect of place attachment. Four hundred and thirteen tourists were surveyed who had visited the Penghu islands, Taiwan. Structural Equation Modeling was used to determine the relationships among the variables and the mediating effects. Results show that the emotions and feelings (place attachment), which tourists have for Penghu, are positively associated with stronger ERB; the extent of attractiveness of island tourism as perceived by tourists is also positively associated with stronger ERB. A higher level of tourists' destination attractiveness in regard to island tourism is associated with stronger place attachment; place attachment was found to exert a significant effect in mediating the relationship between destination attractiveness and ERB. The study shows that when island tourists are attracted by and are attached to the destination, they are more likely to exhibit ERB. The study pioneers the integration of all three factors in a sustainable tourism behavior model designed for tourists who stay one night or more at a destination, and tests the hypotheses for the first time in an Asian destination. Management implications and recommendations for the sustainable development of Penghu islands tourism are provided.

Keywords: destination attractiveness; place attachment; environmentally responsible behavior; Penghu

Introduction

Island tourism was one of the fastest-growing tourism industries between 1990 and 2008 (Zubair, Bowen, & Elwin, 2011). According to Baum (1997), the “unfavorable” geographical factors associated with islands and their insularity help to preserve special tourism resources such as natural ecology and historic artifacts (Beedasy & Whyatt, 1999; Butler, 1993; Gössling, 2003; Péron, 2004; Sheller, 2003). Taiwan's Penghu islands, with their strong tourism development potential, possess such characteristics. The tropical islands are located in the Taiwan Strait. They have a mature tourism industry, a world-class basalt landscape, historic cultural remains, colonial period settlements and architecture, and unique bird species (Penghu County Government, 2011).

Previous studies noted that islands generally have the characteristics of small area and insulated geography (Baum, 1997; Lockhart, 1997), with key features and

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characteristics preserved (Lee, Yang, Chen, & Chen, 2010); however, given the increasing popularity of island tourism, the ecological and cultural environment of the islands may be unable to withstand the influx of more tourists (Conlin & Baum, 1995; IPCC, 2007; UNEP, 2003). Tourism presents a range of potential threats to their natural habitats, as well as local culture (Cole, 1978; Jacobson & Lopez, 1994; Klein, Humphrey, & Percival, 1995). Since environmentally responsible behavior (ERB) is an important indicator of sustainable tourism (Mair, 2011; Moeller, Dolnicar, & Leisch, 2011; Steg & Vlek, 2009; UNWTO, 2011), finding ways to enhance tourists' ERB is critical to the sustainability of island tourism (Bohdanowicz, Zznki-Alujević, & Martinac, 2004).

Substantial evidence suggests that unique ecological environments and folklore make island destinations more attractive and exotic (Khadroo & Seetanah, 2007; Scheyvens & Momsen, 2008). Mayo and Jarvis (1981) defined destination attractiveness as the perceived ability of the destination to fulfill tourists' goals or satisfy their needs (Hu & Ritch, 1993). Previous studies noted that if tourists are attracted by special features embedded within a destination (Borst, Miedema, Vries, Grahama, & Dongena, 2008; Lee, Huang, & Yeh, 2010), their place attachment would be enhanced (Hou, Lin, & Morais, 2005; Lee, 2001). It was also found that tourists' place attachment is positively associated with stronger ERB (Raymond, Brown, & Weber, 2010; Scannell & Gifford, 2010).

The tourism literature shows, therefore, that destination attractiveness is an important indication of tourists' attraction to a destination; place attachment is an important indication of tourists' affective identification and dependence toward a destination; and ERB represents an important indication of sustainable tourism development. While most of the literature discusses the relationship between two of the above three factors (Dolnicar & Leisch, 2008; Hou et al., 2005; Kyle, Graefe, Manning, & Bacon, 2003), integrating all three factors in a sustainable tourism behavior model has not yet been attempted. Recently, a group of scholars explored the correlation between place attachment and pro-environmental behavior in national parks (Ramkissoon, Weiler, & Smith, 2012), as well as relationships between place attachment, place satisfaction and pro-environmental behavior (Ramkissoon, Weiler, & Smith, in press). These new studies differ from earlier research that proceeded from the concept of place attachment, regardless of the antecedent variables that would affect the formation of place attachment. Ramkissoon et al. (2012, in press), however, largely studied tourists on daytrips to national parks; this paper, however, sampled tourists who stayed in a national scenic area for at least one night or more. In addition, previous studies were based on westerners' viewpoints, whereas this study presents the perspectives of Asians; Sofield and Li (2011) explain at length that perceptions between the East and the West on environmental values may not be the same. The cognition perceived by either group could vary across place attachment and responsible environmental behavior. By consolidating the three aforementioned factors, we can determine if tourists' stronger destination attractiveness regarding island tourism is associated with higher place attachment as well as the effects of ERB, and if place attachment plays a significant mediating role. Based on the above introduction, this paper validates the effect of destination attractiveness on ERB (Hypothesis 1); the effect of destination attractiveness on place attachment (Hypothesis 2); the effect of place attachment on ERB (Hypothesis 3); and the moderating role of place attachment between destination attractiveness and responsible environmental behavior (Hypothesis 4). This paper examines the causal relationships among these variables to provide a reference for tourism administrators in enhancing the ERB of island tourists, and to help

government agencies and tourism operators to promote the sustainable development of island tourism.

Literature review

Destination attractiveness

Destination attractiveness is a frequent tourism research issue. Mayo and Jarvis (1981) defined destination attractiveness as the sum of the perceived capability of a destination to deliver satisfaction and benefits to tourists (Hu & Ritchie, 1993). Victor (1989) also asserted that “attractiveness” is the initial motivation for tourists to choose a destination, according to their interests and preferences (Benckendorff & Pearce, 2003). “Attractiveness” is seen as an important perception of tourists when they participate in a tourism activity (Funk, Ridinger, & Moorman, 2004) and is also defined as “a permanent resource” or “permanent construction of a tourism destination”. Attractiveness allows the public to achieve entertainment, interest, and education functions (Hu & Wall, 2005; Leask, 2010) and the strength of destination attractiveness relates to the economic development and performance of the region (Andersson & Getz, 2009; Sofield, 2006). However, islands separated by oceans are more isolated and marginalized than comparable continental areas (Butler, 1993). Their island ecological environments and cultural development can be unique (Khadaroo & Seetanah, 2007), creating a sense of mysteriousness and attractiveness (Scheyvens & Momsen, 2008). People may be curious to visit to see for themselves; their sense of isolation and mystery can make island tourism popular and attractive. When a unique charisma can satisfy people’s needs and expectations, they are more willing to stay in the destination and revisit (Deng, King, & Bauer, 2002; English Tourism Council, 2000; Kozak & Rimmington, 2000; Murphy, Pritchard, & Smith, 2000).

Destination attractiveness is generally measured by core attributes and augmented attributes (Hu & Ritchie, 1993; Thach & Axinn, 1994). Core attributes refer to unique natural or cultural resources, which include history, music, folklore, and special events (Bonn, Joseph-Mathews, Dai, Hayes, & Cave, 2007; Gelbman & Timothy, 2011). Augmented attributes denote functional characteristics, including transportation, narration service, infrastructure and environmental service (Hou et al., 2005).

Place attachment

The concept of place attachment originated from the domain of geography (Tuan, 1977) and was then studied in environmental psychology (Low & Altman, 1992) and architecture (Kaltenborn, 1997). “Place”, the location of a space, can be both tangible and intangible. Along with the passage of time, the meaning and value of place is bestowed by societies and individuals, and presented in individuals, groups, and cultures (Halpenny, 2010). Place attachment is a multidimensional concept of an individual’s psychological process and locality (Scannell & Gifford, 2010), and a person’s positive emotional ties to a specific location (Cuba & Hummon, 1993; Fullilove, 1996; Giuliani, 2003; Hidalgo & Hernández, 2001; Manzo, 2003, 2005; Mesch & Manor, 1998; Riley, 1992; Williams & Vaske, 2003). Place also connects individuals with the natural environment, evoking identification, gratification, and concern for a unique field (Moore & Graefe, 1994), as well as linking affection, perception, and behavior (Harris, Brown, & Werner, 1996).

Therefore, leisure tourism researchers have used place attachment to explore tourists, or recreationists’ attachment emotions and behavior (Bricker & Kerstetter, 2000; Green

& Chalip, 1997; Hou et al., 2005; Hwang, Lee, & Chen, 2005; Kyle, Bricker, Graefe, & Wickham, 2004; Lee & Allen, 1999; Williams & Vaske, 2003).

The majority of leisure tourism scholars measured place attachment with two constructs: place identification and place dependence (Bricker & Kerstetter, 2000; Kyle, Absher, & Graefe, 2003; Moore & Graefe, 1994; Williams, Patterson, Roggenbuck, & Watson, 1992). Place identification denotes an important substructure of self-identity and a critical symbolic link between a person and a location (Lalli, 1992; Stedman, 2002; Williams & Vaske, 2003). Simply put, place identification is a psychological feeling and an affective and symbolic meaning created through the accumulation of experience. By making repeat visits, a person's identification with the place is enhanced and attachment is developed (Moore & Graefe, 1994; Williams et al., 1992). Place dependence reflects how well a setting facilitates users' particular activities, as well as the importance of a place in meeting the functional goals of individuals (Moore & Graefe, 1994). Also, place dependence can easily elicit concrete actions or behaviors from individuals (Schreyer, Jacob, & White, 1981; Williams & Vaske, 2003; Williams et al., 1992).

Environmentally responsible behavior (ERB)

Environmentally responsible behavior (ERB) refers to actions that reflect concerns for the natural environment by individuals or groups (Hungerford & Peyton, 1976) and ways to present or address environmental problems (Hsu & Roth, 1998; Huang & Yore, 2002; Hungerford & Volk, 1990; Marcinkowski, 1988; Sivek & Hungerford, 1989). People with ERB traits initiate behaviors that minimize impacts on the natural environment (Kollmuss & Agyeman, 2002) and even perform actions that benefit the environment (Steg & Vlek, 2009).

People have gradually become more aware that environmental problems should be addressed and urgently resolved (Bamberg & Moser, 2007; Chan & Lam, 2002). Utilizing social sanctions and the promotion of contemporary education and environmental protection can facilitate ERB (Carlsen, Getz, & Ali-Knight, 2001; Halpenny, 2010; Wunder, 2000). Within tourism, many scholars indicated that the choice of travel type is an important factor affecting tourists' willingness to adopt ERB, particularly in nature-based travel (Bamberg & Schmidt, 2003; Harland, Staats, & Wilke, 1999; Heath & Gifford, 2002; Verplanken, Aarts, Van Knippenberg, & Moonen, 1998). Empirical results also show that people can only be persuaded to perform ERB if they have developed a firm commitment to the environment (Abrahamse, Steg, Vlek, & Rothengatter, 2005; Lehman & Geller, 2004; Schultz, Oskamp, & Mainieri, 1995).

Since the 1970s, the significance of ERB has drawn substantial attention from environmental scholars and sociologists, and measurement constructs have evolved (Cottrell & Graefe, 1997). Earlier constructs tackled individuals' attitudes and behaviors towards environment (Dunlap, Gale, & Rutherford, 1973; Schwartz, 1973; Wicker, 1971), and gradually developed into more sophisticated structures involving dimensions of "environmental concern", "verbal commitment" and "perceived knowledge of ecology", as well as "knowledge of issues", "awareness of consequences" and "personal commitment to issue resolution" (Hines, Hungerford, & Tomera, 1986; Hungerford & Volk, 1990; Sivek & Hungerford, 1989). Smith-Sebasto and D'Costa (1995) categorized measuring constructs of environmental behaviors into six groups: "civic action", "educational action", "financial action", "legal action", "physical action", and "persuasive action". This paper examines the environmental behaviors of tourists on the Penghu islands by using the above six dimensions.

Destination attractiveness and environmentally responsible behavior

Environmentally responsible behavior (ERB) also refers to actions taken to minimize damage to the environment, and promote environmental protection (Scannell & Gifford, 2010; Steg & Vlek, 2009). The Penghu islands are ecologically vulnerable and sensitive (Michalena, Hills, & Amat, 2009; Lee, Yang, Chen, & Chen, 2010), yet that ecology is a major attraction for tourists (Austin, 2002; Poria, Butler, & Airey, 2006). This conforms to the characteristic of destination attractiveness proposed by Mazanec, Wöber and Zins (2007). Dolnicar and Leisch (2008) noted that these findings are in line with prior studies which find a strong relationship between moral obligation to environmentally friendly and pro-environmental behavior, such as volunteering time, donating money to environmental groups, voting for pro-environmental political candidates, or joining pro-environmental political action (Berenguer, Corraliza, & Martin, 2005; Dolnicar & Leisch, 2008). These researchers theorized that when tourists are deeply attracted by the destination's environment, they would pay more respect to environmental issues, and voluntarily commit to actions with the least impact on the natural environment, demonstrating ERB. Therefore, this study puts forward the hypothesis:

H1: The perceived destination attractiveness by tourists will significantly and directly affect their environmentally responsible behavior.

Destination attractiveness and place attachment

Past studies treated destination attractiveness as an antecedent variable of place attachment (Lee, 2001; Lee & Allen, 1999), and the two variables have a positive causal relationship. Research results showed that a destination with vast natural resources affects tourists' evaluation of the destination's natural environment and generates place attachment (Warzecha & Lime, 2001; Williams & Stewart, 1998), including items such as scenic beaches, beach sports and resorts located in a greater natural environment (Lee & Allen, 1999; Moore & Graefe, 1994). Other scholars noted that if a destination attracts tourists by providing quality entertainment and recreational activities (Lee & Allen, 1999; Moore & Graefe, 1994) or preserving historic culture, the destination will enhance tourists' place attachment. Therefore, this study posits the hypothesis:

H2: Tourists' perceived destination attractiveness will significantly and directly affect their sense of place attachment.

Place attachment and environmentally responsible behavior

Literature on the effect of the environment on human behavior demonstrated that place attachment is an antecedent of ERB (Alegre & Juaneda, 2006; Budruk, Thomas, & Tyrrell, 2009). In the past, most researches focused on discussing individuals' environmental behavior in their familiar place of residence. Along with the development of geopolitical relationships and obligations to the local environment, individuals develop place attachment and gradually engage in ERB (Hines et al., 1986). Recent studies have applied the two variables to leisure tourism (Gosling & Williams, 2010; Schultz, 2000; Walker & Chapman, 2003), revealing that when individuals develop place attachment to a specific destination, they express care and concern for its environmental protection, and gain more awareness of contemporary environmental issues (Carr, 2002; Lee, 2011; Pooley & O'Connor, 2000; Walker & Ryan, 2008). Examples of ERB include voluntarily picking up trash (Halpenny, 2006; Walker & Chapman, 2003), garbage classification and water conservation (Vaske & Kobrin, 2001), preventing illegal destruction to the environment

(Stedman, 2002), and dedication to the development and maintenance of natural resources (Gosling & Williams, 2010; Halpenny, 2010; Scannell & Gifford, 2010). Thus, when tourists develop significant place attachment to a travel destination, they gain identification with, and dependence on, the destination and demonstrate ERB. Therefore, this study posits the hypothesis:

H3: The perceived place attachment of tourists will significantly and directly affect their environmentally responsible behavior.

Role of place attachment

Lee and Allen (1999) indicate that destination attractiveness is an antecedent factor of ERB. Studies that claim positive causal relationships between destination attractiveness and ERB show that destination attractiveness embedded within natural environments impact on tourists' evaluation of surrounding environment and, subsequently, induce place attachment (Mitchell, Force, Carroll, & McLanughlin, 1993; Warzecha & Lime, 2001). Moore and Graefe (1994) noted that when tourists are influenced by the quality of a destination's leisure and entertainment activities or its heritage (Hou, Lin, & Morais, 2005), they gain respect and express inner affection for the destination, particularly the symbolic meaning or belongingness, and even a sense of centrality and objectivity (Bricker & Kerstetter, 2000). Lee (2001) and Hou, Lin and Morais (2005) also found that destination attractiveness is an antecedent variable of place attachment. Many studies have shown a significant relationship between place attachment and ERB (Clayton, 2003; Dutcher, Finley, Luloff, & Johnson, 2007), especially in the affective identity construct (Bricker & Kerstetter, 2000). Homburg and Stolberg (2006) proposed that individuals' affective expression and identification positively affect ERB and constitute critical factors determining tourist behavior (Grob, 1995; Lee, Backman, & Backman, 1997). This result corresponds to that of Pooley and O'Connor (2000), who stated that when individuals develop special affection and sentiment toward a destination, they become interested in understanding the environmental problems of the destination and further exhibit ERB (Carr, 2002; Gosling & Williams, 2010; Harrison, Burgess, & Clark, 1998). Therefore, some scholars asserted that when people are attached to travel destinations, they show affective dependence and identification (Schultz, 2000) and develop an indivisible relationship with the destination (Kals, Schumacher, & Montada, 1999). In particular, they demonstrate ERB (Kals et al., 1999; Lee, 2011; Mayer & Frantz, 2004). According to the above, we theorize that tourists' attachment to a travel destination plays a mediating role in the relationship between destination attractiveness and ERB, leading to:

H4: Place attachment mediates the relationship between destination attractiveness and environmentally responsible behavior.

According to the above literature review and hypothesis building, the researchers propose the following conceptual framework (see Figure 1).

Methodology

Location selection

This study was based on Taiwan's Penghu islands, whose many attractive attributes have been briefly described earlier in this paper. Now receiving over 100,000 visitors annually, how best to maintain a balance between tourism development and environmental preservation has become an important topic of island tourism.

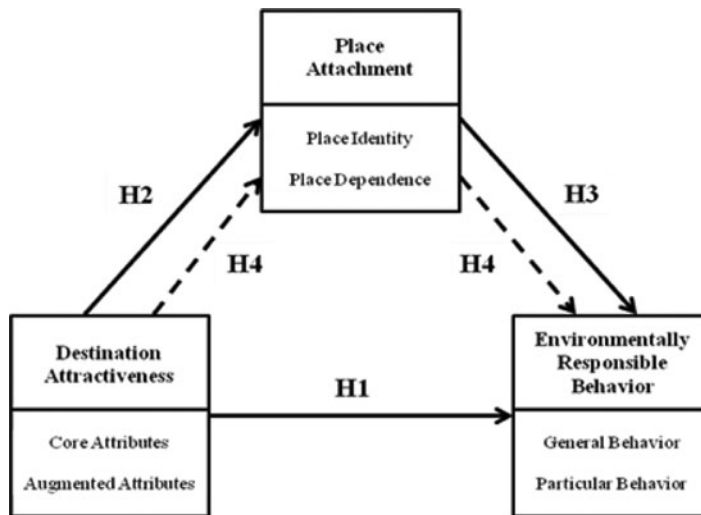


Figure 1. The conceptual model for Penghu island tourists. Note: → Means directly affect; ----> means indirectly affect.

Sample selection and data collection

A judgmental sampling approach was employed to target respondent tourists who were on their return trip from Penghu's main airport, Magong, between July and August, 2010. During this peak season, tourists to the Penghu islands comprised many diverse segments in terms of age groups, professions, and income levels, giving a wide ranging study population. In order to reduce the incidence of null questionnaires in this study, the authors selected one from every twenty respondents, meeting Ritter, Rendle and Coughlin's (2002) requirement that data reliability could be enhanced by including fewer interviewees from groups. A total of 450 questionnaires were distributed and 413 valid copies were received, indicating a response rate of 92%.

Questionnaire design

The questionnaire was divided into two main sections. The first section involved 26 items, including 10 on destination attractiveness (five on "Core attributes" and five on "Augmented attributes"), eight items on place attachment (four items on "Place identification" and four on "Place dependence") and eight items on ERB (four on "General behavior" and four on "Particular behavior"). The destination attractiveness scale replicated the core attribute and attachment attribute scales proposed by Hu and Ritchie (1993) and Thach and Axinn (1994), respectively. These items were modified to be relevant to local characteristics, including: ecological environment, unique geology, natural landscape, historical culture, hospitality and lodging, as well as transportation and construction. The place attachment scale replicated the place identification and place attachment constructs proposed by Williams and Roggenbuck (1989). The ERB scale was adapted from Smith-Sebasto and D'Costa's (1995) work. All scales were 5-point Likert types ranging from 1 (Strongly disagree) to 5 (Strongly agree). To understand the sample distribution and structure, the second section of the questionnaire included tourists' background information. Demographic variables included gender, age, marital status, education level, occupation, monthly income,

area of residence, and travel frequency. A copy of the research instrument can be found in the online version of this paper at www.tandfonline.com/JOST.

Reliability and validity analysis

To measure the research constructs and correlation among the constructs, confirmatory factor analysis was used to test the reliability and validity of the surveys and to support the existence of the three variables depicted in Figure 1 (destination attractiveness, place attachment, and ERB). Table 1 shows that the Cronbach's α of all sub-dimensions of the four sets of variables reached 0.7, satisfying the requirement of internal consistency (Hair, Anderson, Tatham, & Black, 1998). In addition, factor loadings (between 0.55 and 0.91) were significant ($p < 0.001$) and fell within the suggested threshold value of 0.50 and 0.95 (Bagozzi & Yi, 1988). Composite reliability (CR) was higher than 0.60 (Fornell & Larcker, 1981), indicating good reliability of the constructs measured in this study (Jöreskog & Sörbom, 1996).

The scale's validity was assessed by the average variance extracted (AVE), which is the variance in the indicators, explained by the common factor-related variance extracted. Moreover, when the items of dimensions are associated, the validity will exist. AVEs above 0.5 are treated as indications of convergent validity (Fornell & Larcker, 1981). Meanwhile, discriminant validity means that when items of one dimension are assembled or respond to each other, there should be negative correlation between the said items and the items of the confronting dimension. And evidence of discriminant validity is shown if the AVE is greater than the square of the construct's correlations with the other factors. The AVE for the scale ranged between 0.61 and 0.81, and the square of the AVE in each construct ranged between 0.78 and 0.90, which were greater than the constructs' correlations (see Table 2). The above shows that the scale has good convergent and discriminant validity (Fornell & Larcker, 1981).

Results

Respondents' profile

The respondents were mostly female (53%), and 18 to 25 years old (39.5%). Most respondents were students (29.1%), followed by employees of the service industry (19.9%), and soldiers/teachers/government officials (18.9%). Most were single (66.6%) and were university or college graduates (64.2%). Many respondents had limited monthly income: those earning NT\$10,000 (US\$1 = NT\$29.40) or below accounted for 27.4%, followed by NT\$10,000–NT\$30,000 (26.6%). Most of the respondents resided in Northern Taiwan (34.4%), followed by Southern Taiwan (30.3%). 42.1% of respondents have visited Penghu more than three times (42.1%); 41.6% visited Penghu once. The profile of respondents is summarized in Table 3.

Structure model

To measure the causal relationships between the latent variables and the observable variables, this study used Structural Equation Modeling (SEM) and maximum likelihood estimation (MLE) to estimate the correlations of variables in the proposed model. SEM was used to evaluate the influence of destination attractiveness and place attachment on ERB (Hypotheses 1 to 4). To measure the relationship between the independent variable

Table 1. Confirmatory factor analysis of dimensions and items.

Measured variables and dimensions	Factor loading	CR ^b	AVE ^a	Cronbach's α R^2
<i>Destination attractiveness</i>				
Core attributes		0.91	0.67	0.81
Unique eco-environment of the island	0.65***			0.78
The equivalent of basalt landscape of World Heritage	0.62***			0.78
Beautiful scenery of beach and sea	0.81***			0.74
Special fishing village culture and seafood catch	0.68***			0.77
Historical vestiges and temple culture	0.63***			0.78
Augmented attributes		0.93	0.73	0.84
Well-appointed accommodation and restaurants	0.73***			0.80
Clear and detailed interpretation services and facilities	0.79***			0.79
Unique local specialties and souvenirs	0.59***			0.83
Convenient transportation	0.73***			0.80
Well-developed environment management	0.74***			0.80
<i>Place attachment</i>				
Place identification		0.94	0.80	0.88
Touring Penghu has a deep meaning for me	0.71***			0.87
I have a strong sense of identifying with Penghu islands tourism	0.91***			0.81
I have a strong sense of belonging in regard to Penghu islands tourism	0.85***			0.83
I have special feelings for the Penghu islands and the tourists	0.74***			0.86
Place dependence		0.94	0.81	0.88
I like to engage in tourism activities in Penghu better than other tourist destinations	0.83***			0.84
I gain more satisfaction from Penghu tourism than other tourist destinations	0.87***			0.83
Engaging in Penghu tourism is more important than other tourist destinations	0.86***			0.83
There is no substitute for the tourist attractions of the Penghu islands	0.68***			0.88
<i>Environmentally responsible behavior</i>				
General behavior		0.86	0.61	0.76
I will try to learn how to solve environmental problems on the Penghu islands	0.55***			0.75
I will read the reports or books about the environment of the Penghu islands	0.68***			0.70
I will discuss with people the issues of environmental protection on the Penghu islands	0.76***			0.67
I will try to convince partners to protect the natural environment on the Penghu islands	0.69***			0.70
Particular behavior		0.89	0.66	0.80
When I see others engaged in the destruction of the environment on the Penghu islands, I will report it to the relevant units	0.77***			0.72
I will follow the legal ways to stop the destruction of the environment of the Penghu islands	0.71***			0.75
When I see garbage and tree branches on the beach, I will pick them up	0.73***			0.73
If there are cleaning activities on the beach, I would like to attend	0.61***			0.78

Note: *** indicates $p < 0.001$.

^a Average variance extracted = $(\sum\lambda^2) / [\sum\lambda^2 + \sum(\theta)]$.

^b Composite reliability = $(\sum\lambda)^2 / [(\sum\lambda)^2 + \sum(\theta)]$ (Jöreskog & Sörbom, 1996).

Table 2. Means, standard deviations and correlations of scales.

Variables and items	Means	SD	1	2	3	4	5	6
1. Core attributes	4.38	0.53	(0.82)^b					
2. Augmented attributes	3.77	0.73	0.48 ^a	(0.85)				
3. Place identification	3.82	0.73	0.53	0.45	(0.89)			
4. Place dependence	3.47	0.76	0.34	0.31	0.63	(0.90)		
5. General behavior	3.67	0.61	0.42	0.31	0.53	0.44	(0.78)	
6. Particular behavior	3.60	0.66	0.34	0.28	0.45	0.35	0.64	(0.81)

Notes: ^a Correlations are estimates from a confirmatory factor measurement model.

^b Bold numbers on the diagonal parentheses are the square root of each construct's AVE; $p < 0.001$.

(destination attractiveness) and the dependent variable (ERB), this study used Bootstrap to understand the effect of the mediator of place attachment. All analyses were conducted with IBM SPSS AMOS 20 using the variance-covariance matrices. The overall model's goodness of fit was first tested (McDonald & Ho, 2002). Model fit was assessed using four indicators (i.e., χ^2/df , RMSEA, NFI, CFI, GFI). To test the mediating effect of place attachment, this study replicated the framework proposed by Baron and Kenney (1986) and Shrout and Bolger (2002), which mainly involves entering the third important variable to explain the relationship between the independent variable and the dependent variable; full mediation occurs if the effect of the independent variable on the dependent variable becomes non-significant. The researchers applied the above to examine the mediating effect of place attachment on the relationship between destination attractiveness and ERB.

The analysis results of testing for hypothesis 1

First, the researchers examined whether destination attractiveness has a positive effect on ERB, in order to confirm the mediating role of place attachment in the subsequent analysis. The test on goodness of fit showed that $\chi^2 = 0.21$, $df = 1$; Normed Chi-square Index (NCI) (χ^2/df) = 0.21; Goodness of Fit Index (GFI) = 1.00; Adjusted Goodness of Fit Index (AGFI) = 0.997; Comparative Fit Index (CFI) = 1.00 and Normed Fit Index (NFI) = 0.999; all figures exceeded the threshold value of 0.9. Root Mean Square Residual (RMR) = 0.002, which is lower than the threshold value of 0.05 and Root Mean Square Error of Approximation (RMSEA) = 0.00, which is lower than the threshold value of 0.08. The above figures all satisfied the goodness-of-fit parameters suggested by Jöreskog and Sörbom (1984). The researchers thus concluded that the proposed model has good fitness (see Table 4). According to the path analysis results, the direct effect of island tourists' destination attractiveness on ERB was significant, accounting for 0.60 ($p < 0.001$) (see Figure 2). This result indicated that the path of island tourists' destination attractiveness relative to ERB was positive and significant. The higher the island tourists' destination attractiveness, the stronger the ERB will prevail, supporting H1 of this study.

The analysis results of testing for hypothesis 2 and hypothesis 3

After confirming the positive direct effect of destination attractiveness on ERB, this study further explored whether the relationship between these two constructs was affected by place attachment. The researchers therefore established the "mediating model", which had the following goodness-of-fit indicators. $\chi^2 = 5.64$, $df = 6$, NCI (χ^2/df) = 0.94; GFI = 0.99, AGFI = 0.98, CFI = 1.00, NFI = 0.99, all exceeding the threshold value of 0.9. RMR

Table 3. Demographic profile of the respondents.

Variable	<i>n</i>	%
Gender		
Male	194	47.0
Female	219	53.0
Age (years)		
18–25	163	39.5
26–35	141	34.1
36–45	73	17.7
46–55	26	6.3
≥56	10	2.4
Marital status		
Married	133	32.2
Unmarried	275	66.6
Others	5	1.2
Education level		
Elementary school or below	3	0.7
Junior high school	13	3.1
Senior high school	88	21.3
University or college	265	64.2
Graduate school	44	10.7
Occupation		
Soldier/teacher/government official	78	18.9
Businessman/worker	57	13.8
Service industry	82	19.9
Freelancer	26	6.3
Student	120	29.1
Housekeeper	10	2.4
Farm/fishing/livestock industry	7	1.7
Retired	2	0.5
Other	31	7.5
Monthly income (NT\$ ^a)		
≤10,000	113	27.4
10,001–30,000	110	26.6
30,001–40,000	63	15.3
40,001–50,000	61	14.8
50,001–60,000	30	7.3
≥60,001	36	8.7
Residence		
Northern Taiwan	142	34.4
Middle Taiwan	85	20.6
Southern Taiwan	125	30.3
Eastern Taiwan	9	2.2
Islands (Kinmen, Matsu, Penghu)	47	11.4
Others	5	1.2
Past experience		
Once	172	41.6
Two times	67	16.2
More than three times	174	42.1

Note: ^aUS\$1 = NT\$29.40 (30 October 2012).

Table 4. Goodness-of-fit test for destination attractiveness and environmentally responsible behavior.

Indices	Model fit	Criteria	Test result of measurement
<i>χ²-test</i>			
χ ² /df (NCI)	0.21 (0.21/1)	<3	Yes
<i>Absolute fit measures</i>			
GFI	1.00	>0.90	Yes
AGFI	0.98	>0.90	Yes
RMR	0.00	<0.05	Yes
RMSEA	0.00	<0.08	Yes
<i>Baseline comparisons</i>			
NFI	1.00	>0.90	Yes
RFI	0.97	>0.90	Yes
IFI	0.95	>0.90	Yes
CFI	1.00	>0.90	Yes

of 0.01 was lower than the threshold value of 0.05 and RMSEA of 0.00 was lower than the threshold value of 0.08.

Overall, the proposed model had good fit (see Table 5). Moreover, the path analysis results showed that the direct effect of destination attractiveness on place attachment was significant at 0.74 ($p < 0.001$) and the direct effect of place attachment on ERB was significant at 0.49 ($p < 0.001$). These results indicated that the path of island tourists' destination attractiveness on place attachment was positive and significant. In other words, the higher the tourists' place attachment, the higher their ERB; this supports H2 and H3 of this study. The results are shown in Figure 3. However, after entering place attachment into the proposed model, the direct effect of destination attractiveness on ERB was not significant at 0.24 ($p < 0.05$). It was found that place attachment indirectly affected ERB through destination attractiveness; the indirect effect was 0.36 ($p < 0.01$).

The analysis results of testing for hypothesis 4

According to the above results, the researchers checked to see if a spurious relationship exists between destination attractiveness and ERB. A spurious relationship is one in which two latent variables have no direct causal relationship, yet due to the presence of a third variable, it may be wrongly inferred that they do. In other words, the original relationship may be explained or influenced by a mediating variable (Bollen, 1990). In the proposed model, destination attractiveness only had an indirect effect of 0.36 (0.74×0.49) on ERB. To explore H2 in depth, the researchers examined the causal relationships according to the

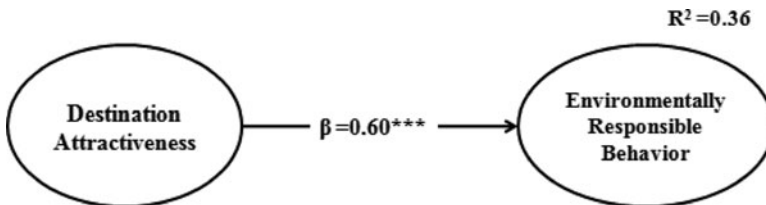


Figure 2. Effect of destination attractiveness and environmentally responsible behavior. Note: *** indicates $p < 0.001$.

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Table 5. Goodness-of-fit test for the mediation model.

Indices	Model fit	Criteria	Test result of measurement
<i>χ^2-test</i>			
χ^2/df (NCI)	0.94 (5.64/6)	<3	Yes
<i>Absolute fit measures</i>			
GFI	0.99	>0.90	Yes
AGFI	0.98	>0.90	Yes
RMR	0.01	<0.05	Yes
RMSEA	0.00	<0.08	Yes
<i>Baseline comparisons</i>			
NFI	0.99	>0.90	Yes
RFI	0.97	>0.90	Yes
IFI	0.95	>0.90	Yes
CFI	1.00	>0.90	Yes

path analysis, which is illustrated in Figure 4. When place attachment was excluded from the model, the effect of destination attractiveness on ERB became significant, with a direct effect of 0.60 ($p < 0.001$). This result revealed that H2 was indeed a spurious relationship. In other words, the effect of destination attractiveness on ERB existed only through the effect of the mediated variable: place attachment.

This study further examined the complete mediation role of place attachment in the relationship between destination attractiveness and ERB. Fit indicators of the “full mediation model” were: $\chi^2 = 9.11$, $df = 7$, $NCI (\chi^2/df) = 1.30$, which were lower than the threshold value of 3; $GFI = 0.99$, $AGFI = 0.97$, $CFI = 1.00$, and $NFI = 0.99$, all exceeding the threshold value of 0.9. $RMR = 0.01$, which was lower than the cutoff of 0.05, and $RMSEA = 0.03$, which was lower than the cutoff of 0.08. Overall, the full mediation model was a good fit (see Table 6). Empirical testing of the model showed that the direct effect of destination attractiveness on place attachment was significant at 0.77 ($p < 0.001$). The direct effect of place attachment on ERB was significant at 0.70 ($p < 0.001$). Destination attractiveness affected ERB via place attachment, and the influence effect was 0.54 ($p < 0.01$). The empirical results of this study demonstrated that place attachment has a full

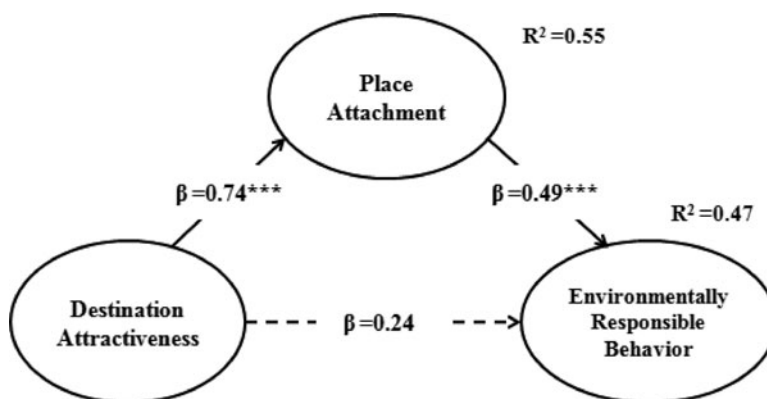


Figure 3. The effects of destination attractiveness, place attachment and environmentally responsible behavior. Note: *** indicates $p < 0.001$.

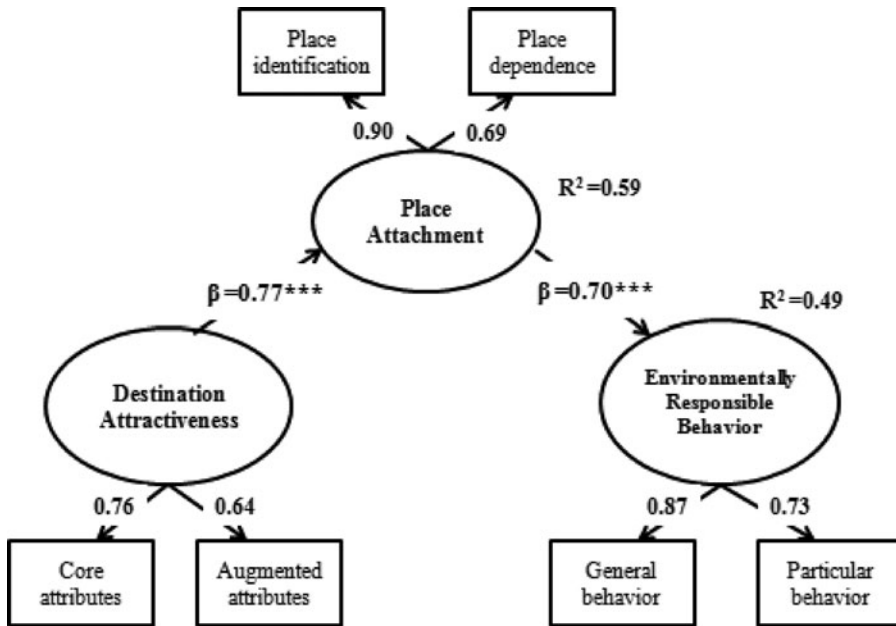


Figure 4. The test for the complete mediation model of place attachment. Note: *** indicates $p < 0.001$.

moderating effect on the relationship between destination attractiveness and ERB (see Figure 4), supporting H4 of this study.

Discussion

This research examined the relationships among destination attractiveness, place attachment and ERB in Taiwan’s most popular island destination, the Penghu islands. Results show that the higher the tourists’ perception of destination attractiveness, the higher was place attachment. Thus, destinations that possess the core resources of travel

Table 6. Goodness-of-fit test for the complete mediation model.

Indices	Model fit	Criteria	Test result of measurement
χ^2 -test			
χ^2/df (NCI)	1.30 (9.11/7)	<3	Yes
<i>Absolute fit measures</i>			
GFI	0.99	>0.90	Yes
AGFI	0.97	>0.90	Yes
RMR	0.01	<0.05	Yes
RMSEA	0.03	<0.08	Yes
<i>Baseline comparisons</i>			
NFI	0.99	>0.90	Yes
RFI	0.96	>0.90	Yes
IFI	0.95	>0.90	Yes
CFI	1.00	>0.90	Yes

activities can better attract a greater volume of visits and elicit tourists' place attachment. Also, the core dimension of destination attractiveness is the major source of influence and place attachment is particularly reflected in place identification. Results correspond to those of Lee (2001) and Warzecha and Lime (2001), and support destination attractiveness's role as an antecedent variable in predicting place attachment. Therefore, destination attractiveness can be considered a strong and effective predictor of place attachment.

Compared to Taiwan's neighboring islands, Penghu has the largest hinterland and its heritage and culture are unique. Tourists are, therefore, willing to revisit the destination. Tourism management should use this attractiveness to enhance their strategies of promoting tourists' destination attachment. Dolnicar and Leisch (2008) and Vining and Ebreo (2002) indicate that a positive relationship exists between destination attractiveness and ERB. These observations are supported by our study, confirming that the higher the tourists' perceptions of destination attractiveness, the greater the likelihood that ERB will prevail. The administrators of Penghu islands tourism could enhance destination attractiveness through careful marketing strategies based on this finding.

The results of this study mirror those of Vaske and Kobrin (2001), who offered evidence that place attachment would lead to the performance of ERB, as did numerous previous studies (e.g. Budruk, Thomas, & Tyrrell, 2009; Everett & Aitchison, 2008; Lee, 2011). In other words, tourists with higher attachment to the Penghu islands would voluntarily exhibit ERB, picking up street garbage and convincing friends and relatives to adopt pro-environment behaviors.

When probing the relationships among destination attractiveness, place attachment, and ERB, this paper found that originally destination attractiveness positively and significantly influences ERB. However, after including place attachment in the causal relationship of the model, this paper finds that the direct effect of destination attractiveness on ERB no longer exists. ERB should be influenced through place attachment. The finding demonstrates that place attachment plays a total moderating role between destination attractiveness and ERB.

Conclusion

The study explores the relationship between place attachment of a destination and ERB from the tourists' perception of destination attractiveness, with the purpose of constructing a behavioral model for the sustainable development of island tourism. Research results show that: (1) in the relationship between destination attractiveness and place attachment, stronger destination attractiveness is associated with a higher degree of place attachment, and the major contributor is identification rather than dependence on resources and facilities; (2) in the relationship between destination attractiveness and ERB, stronger destination attractiveness is associated with stronger ERB toward the destination's environment; (3) in the relationship between place attachment and ERB, higher place attachment enhances ERB; and (4) place attachment plays a significant mediating role in the relationship between destination attractiveness and ERB.

The SEM model proposed in this study demonstrates that destination attractiveness can effectively enhance island tourists' place attachment and ERB. Therefore, administrators of Penghu islands tourism should pay attention to strengthening tourists' image of, and interest in, the destination's attractiveness. First, the researchers suggest that the local government shoot quality documentaries or advertisements of famous sites, to record these as valuable core attributes. These attributes may include the splendid basalt landscape, the

cultural experience of visiting a fishery village and a tour of historic sites and temples. Also, through the promotion of travel programs, media, and the Internet, and supported with effective interpretations in multiple languages, the administrators could expand the Penghu islands' reputation and enhance exposure in an effort to capture more tourist attention. Second, administrators should enhance the planning and management of attribute attractiveness, such as helping upgrade lodging and food and beverage quality, improving the convenience of transportation, and establishing environmental management mechanisms at heavily visited sites. Through word-of-mouth and promotions, tourists can gain a deep impression and memory of the Penghu islands' destination attractiveness. Third, after tourists develop place attachment to the destination, they would demonstrate ERB and benefit the administration of the destination. Therefore, to conserve the natural ecology and historical culture, administrators should institute laws to penalize behaviors that are detrimental to the environment, but also raise tourists' attachment to the destination in the hope of enhancing tourists' ERB. For example, they could leave leaflets in every bedroom (bedside browsers), install bulletin boards to promote and educate tourists to help them actively demonstrate behaviors to protect the Penghu islands, environment (e.g. picking up garbage and preventing others from destroying the environment), play "we care for the Penghu islands" news reports in tourism centers and have interpreters provide tourists with information regarding Penghu environmental protection in order to enhance tourists' affective identity.

Another important finding of this study is that place attachment plays a mediating role in the relationship between destination attractiveness and ERB. Therefore, determining how to get island tourists to develop strong place attachment has become an important topic for administrators. First, the researchers suggest improving the quality of the existing interpretation service. For example, adopting first person interpretation can allow tourists to become immersed in Penghu island's history. Through understanding the natural ecology unique to the islands, tourists can develop a new perspective and passion regarding the importance of environmental preservation, stimulate inner affections and concern, and form a sense of identification and belongingness with the local environment. The administrators should strive to satisfy and match island tourists' real needs and services so that tourists can develop a sense of dependence on the destination. The irreplaceable values of Penghu islands compared to other travel destinations can be elevated.

Future research directions

Some research limitations should be addressed. First, the predominant form of tourism to the Pescadores is mass tourism. To address this limitation, future studies could examine travel itineraries with different attributes, such as ecological travel, cultural travel, religious travel, and national scenic area travel, to determine whether there are differences given the different travel modes. Second, this study adopts judgmental sampling to measure the ERB of tourists returning from their visits, and the survey was conducted during the peak season summer vacation. Low season tourists may be different. Future studies can focus on a longitudinal study to confirm the effects of tourists' perceived place attachment and destination attractiveness on the promotion of ERB. Third, although this study empirically tested the relationships among place attachment, destination attractiveness, and ERB, subsequent studies can incorporate other variables (e.g. environmental knowledge, environmental sensitivity and environmental attitude) to further confirm the causal relationships between other environmental factors and ERB.

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