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Place Attachment and Environmentally Responsible Behavior: The Mediating Role of Destination Psychological Ownership

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Abstract: This study aimed to explore the relationship between place attachment and environmentally responsible behavior, and to verify the mediating role of destination psychological ownership in the above relationship. We surveyed scuba divers in Taiwan as the research subjects and obtained 361 valid questionnaires. After conducting a literature review and examining related theories, we proposed a theoretical model and used the structural equation model for analysis. The results showed that the overall model fitted well, place dependence directly affected place identity, and place dependence and place identity both positively and directly influenced environmentally responsible behavior. Furthermore, the testing showed that destination psychological ownership could play a mediating role on the relationship between place attachment and environmentally responsible behavior.

Keywords: place dependence; place identity; environmentaly responsible behavior; destination psychological ownership; scuba diving

1. Introduction

The attractiveness of tourist destinations often depends on the attractiveness of their culture and ecological environment [1]. However, attractions are usually affected by the rapid development of the tourism industry and suffer a negative influence [2]. Factors that are not conducive to the development of tourist destinations might seriously affect the sustainable development of tourist destinations [3]. Taking into account the limitation and fragility of cultural or natural environmental resources, to effectively reduce the impact and consumption of tourists, understanding the primary factors that lead tourists to develop environmentally responsible behavior (ERB) and the application of management strategies [4] are of crucial importance.

In recent years, research related to ERB has attracted the attention of scholars. Among the variables that could be used to predict the ERB of tourists, related concepts to describe the link between people and places have attracted more attention [5], including emotional involvement [6], connection with nature [7], and place attachment [8]. Scholars have even established a strong consensus on the relationship between place attachment and ERB of tourists [5]. Place attachment refers to any positive or negative relationship, i.e., a cognitive and emotional connection, between an individual and a place, which is usually caused by the individual’s complex experience of, and emotional connection with, the place [9–11]. When tourists develop place attachments, they tend to have a positive attitude and exhibit responsible behavior toward the environment [12,13].
Based on self-congruity theory, individuals tend to establish deep psychological connections with objects that are consistent with their self-concept [14]. In research on tourism, the concept of destination psychological ownership (DPO) is an essential form of this psychological connection [14]. As DPO is based on self-concept, it is a psychological state that develops in tourists when they occupy a destination [15]. DPO may also trigger an individual’s sense of responsibility [16], which could prompt him/her to feel responsible for the destination’s natural environment and even directly affect his/her ERB [14,16].

According to the above, place attachment and DPO are both important predictive variables of ERB, as indicated in many previous studies [14,17–19]. However, a few studies have also claimed that place attachment affects ERB through the mediating effect of higher-level psychological mechanisms, such as conservation commitment [20]. Moreover, in their in-depth study of the relationship between the two subconstructs of place attachment (place dependence and place identity) and ERB, Vaske and Kobrin [21] found that place dependence affects ERB through the mediating effect of place identity. Previous research on the relationship between DPO and environmental behavior has also found that DPO usually plays a mediating role. For example, Li et al. [14] asserted that self-image consistency could affect tourist ERB through the mediating effect of DPO. Destination identity and sense of belonging could affect tourist revisit behavior through the mediating effect of DPO [15].

The above argument implies that place attachment with consistency of place identity might drive ERB by activating DPO from the link between people and places. In other words, DPO might play a mediating role in the relationship between place attachment and ERB. However, only a few researchers have paid attention to this idea. Therefore, this research attempts to use DPO to connect the two subconstructs of place attachment with ERB, in order to provide new insights into the mechanism of triggering ERB from the perspective of the psychological connection between tourists and destinations.

2. Literature Review
2.1. Place Attachment

Place attachment is a concept which aims to synthesize the many facets of people-place relationships into a single-framework in order to enable a systemic analysis of those place-associated themes [10]. One of the more recent approaches to place attachment is the “Person-Process-Place” framework [10]. This particular framework attempts to highlight the multidimensionality of the place attachment concept. The first dimension is the person. In this dimension, place attachment occurs both on individual and group levels. The second dimension comprises a combination of psychological processes that are manifested in place attachment such as affect, cognition and behavior. The third dimension concerns the object, towards which the attachment has formed. In this dimension, place characteristics are explored, such as the nature and specific elements of the place that have become objects of attachment [10].

In the “Process” dimension, based on social bonding and affective attachment for a local environment, the physical and social attributes at a place may give rise to a strong sense of place identity involving not only localized experiences, but also specific memories about how others feel about the place [22]. That is to say, when an individual incorporates himself into the local environment and senses that he belongs to a given place, he will identify with the place, and even produce behavior of attachment to that place [23]. Moreover, as a behavior domain of sense of place [23], place dependence refers to the behavioral exclusivity of the place in comparison to alternatives. Individuals perceive the functional meanings of a place as special to them, i.e., a suitable setting to perform certain activities [24]. However a person may not be aware of their place dependence until an area is under threat, at which time that person’s link to a place is recognized [25].

In the fields of tourism and leisure, the literature has provided a wealth of evidence that place attachment has made an essential contribution to understanding tourist behavior [9,26]. Although most scholars have claimed that place attachment is a multiconstruct concept [27], many studies have only focused on the relationship between place depen-
Place dependence (functional attachment) refers to a judgment of the individual based on the uniqueness and functional value of a place to indicate that the place is suitable for certain activities [30]. Place identity (affective attachment) is a sense of belonging in a place that refers to the particular emotional and symbolic significance of the interaction between the individual and the place [24]. In summary, place dependence and place identity are both the psychological products of place attachment [31].

Moreover, place attachment has also been shown to stimulate stewardship actions [32] which promote the sustainable development of specific places [32]. The connection between people, place, and nature has also helped us to understand social motivations and identify and develop paths to achieve sustainable development [33].

### 2.2. Environmentally Responsible Behavior

ERB refers to the behavior of individuals engaged in promoting the sustainable development of the environment, reducing negative environmental impacts [6], and taking further actions that are beneficial to the environment [34]. Therefore, ERB is usually regarded as a critical factor to ensure the sustainable development of tourist destinations [35].

Measurements of ERB have been becoming more widespread since the 1970s [36]. For example, Hungerford and Payton [37] argued that persuasion, eco-management, consumerism, political action, and legal action are the primary elements of ERB in their research on the teaching principles of environmental education. Smith-Sebasto and D’Costa [38] used six constructs to measure the ERB of students, including civic action, educational action, financial action, legal action, physical action, and persuasive action. Thapa [39] measured the ERB of outdoor leisure participants from five aspects: political action, recycling, education, green consumption, and community activism. The results showed that there might be differences in the measurement of ERB in different situations. At the same time, some scholars have measured ERB from a more comprehensive perspective and proposed a more general ERB measurement method [5]. For example, Vaske and Kobrin [21] divided ERB into general ERB and site-specific ERB. Lee and Jan [40] used this scale when studying the ERB of tourists. It is believed that dividing ERB into general and site-specific could lead to a better understanding of tourist behavior [41]. Therefore, this study also uses these two types.

Previous literature has also found that many variables are related to the ERB of tourists [20], including environmental attitudes [42], commitment to the natural environment [43], pleasant experiences [44], and degree of involvement [45]. However, the connection between tourists and tourist destinations is believed to be the most critical factor influencing ERB [5,27].

### 2.3. Destination Psychological Ownership

The research on psychological ownership began in the field of organization management. Psychological ownership is a state in which the individual feels that the object of ownership or part of the object seems to be “theirs” [46]. The core of psychological ownership is a universal sense of ownership. The generation and existence of psychological ownership do not depend on legal ownership. Peck and Shu [47] found that individuals have favorable emotions towards an ownership target when psychological ownership exists. Psychological ownership can enable individuals to regard the target or part of the target as an extended self, leading to the sense of responsibility and positive behavior of the individual towards the ownership target [48]. Psychological ownership is related to the three basic human needs [49,50]: the need for efficacy, self-identity, and having a place [48,51]. Furthermore, psychological ownership can enhance the sense of responsibility for the target. Therefore, psychological ownership includes the four constructs of efficacy, self-identity, sense of belonging, and sense of responsibility [52].

Avey et al. [52] pointed out that the “target” in the definition of psychological ownership covers a wide range of content, including tangible or intangible things. Tourists are
the key stakeholders of the tourist destination, with three conditions for their psychological ownership of destinations for tourism and recreation. For example, tourists have a sense of psychological control over a destination due to their self-efficacy. Tourists might invest individual resources, including energy, stamina, and effort, as the destination may meet their recreational needs. Considering the viewpoint of Avey et al. [52], we assert that tourists do exhibit psychological ownership of tourist destinations. Therefore, according to research by Pierce and other scholars [46, 48], this study defines DPO as the psychological state of tourist ownership towards tourist destinations. It describes the extent to which tourists regard a tourist destination as “theirs.” Tourists who have established psychological ownership towards a destination tend to show a strong sense and behavior of “ownership”, and are ready to contribute their efforts to the sustainable development of the destination. DPO satisfies the need for a sense of belonging, self-efficacy, and self-identification, resulting in tourists regarding the destination as an extension of themselves and exhibiting a series of positive off-role behavior, including word-of-mouth marketing, actively helping tourists, and spontaneously maintaining the order and environment of the destination.

3. Research Hypotheses and Theoretical Model

3.1. Place Attachment and Environmentally Responsible Behavior

Researchers have generally conceived place attachment as a multidimensional construct, such as social bonding, affective attachment, place identity and place dependence. The number of salient dimensions and their relationships with antecedents and outcome variables vary across contexts and samples [53]. Nonetheless, it has been noted that bi-dimensional conceptualization is prevalent in the literature, namely, place identity and place dependence. Moreover, in the literature discussing the relationship between place attachment and ERB, many authors have also used bi-dimensional conceptualization, for example, Vaske and Kobrin [21], Cheng, Wu, and Huang [54], Lee [20], Cheng and Wu [18]. The conclusions presented by these authors are quite consistent. For example, place attachment directly and positively affect ERB [18, 20, 54], and place dependence directly affects place identity [21]. In order to compare our results with those of the above research, in this study, the measurement of place attachment also adopts bi-dimensional conceptualization.

In research on the influence of place attachment on an individual’s attitudes and behavior, Williams and Patterson [55] proposed that the individual’s psychological attachment to a place would prompt him/her to perform ERB. Other scholars have found that tourists with strong place identity are willing to pay higher resource conservation fees [12]. When an individual has a strong attachment to a particular recreational spot, he/she can become the protector of the resources of that place, and adopt a supportive attitude towards its management [9]. Vaske and Kobrin [21] also pointed out that when individuals have feelings about local natural resources, their behavior in daily activities and places appears to be more responsible with regard to the environment. Moreover, some leisure and tourism scholars have regarded place attachment as the prerequisite of ERB [5, 18, 21, 54, 56] or pro-environmental behavior [17, 27, 57].

Based on the research results of the above scholars on place attachment and ERB, and the significant attention paid to the relationship between place dependence and place identity when measuring place attachment [5, 20, 28, 29, 58], this study puts forward the following hypotheses:

**Hypothesis 1 (H1).** Place dependence has a direct and positive impact on environmentally responsible behavior.

**Hypothesis 2 (H2).** Place identity has a direct and positive impact on environmentally responsible behavior.

**Hypothesis 3 (H3).** Place dependence has a direct and positive impact on place identity.
3.2. The Mediating Effect of Destination Psychological Ownership

DPO describes the extent to which tourists regard tourist destinations as “theirs” and even experience a psychological state of possessiveness towards the destination [15,16]. This concept has provided novel insights into tourist behavior by focusing on the deep psychological connection between tourists and particular destinations [15]. According to the theory of psychological ownership, self-identity and a sense of belonging related to the target could stimulate a sense of ownership [48,52,59,60]. In the tourism industry, destinations are a source of self-identification for tourists and provide a sense of belonging [61]. Destination identity represents consistency between the tourists’ identity and the characteristics of the destination. By contrast, a sense of belonging represents the tourists’ dependency on, and membership relationship with, the destination [62].

Self-identity is an essential aspect of psychological ownership [14,15,48,52]. As ownership is a symbolic representation of an individual’s self-identity, once ownership becomes a part of the individual’s self-definition, it creates the individual’s self-identity [63]. Similar to the concept of brand identity, in the fields of tourism and recreation, tourists identify with a destination based on the similarity between the various characteristics of the destination and their self-characteristics [64–66]. In this situation, the tourist’s identification with the destination (place identity) represents a close emotional connection between the individual and the destination. The destination may be incorporated into, and used to define, the extended self. Therefore, tourists with destination identity are likely to have DPO [15]. Thus, this study puts forward the following hypotheses:

Hypothesis 4 (H4). Place identity has a direct and positive impact on DPO.

Factors based on spatial requirements (such as having a place) are also among the main aspects affecting psychological ownership [15,48,59]. At a familiar destination, a tourist may feel as if they were at home [67], and would be willing to invest a significant amount of emotion [68], as this sense of familiarity or dependence on the place may elicit a sense of security [48]. The concept of having a place is similar to that of place dependence. Place dependence refers to the tourists’ functional attachment to a destination, representing the extent of the destination’s ability to meet tourists’ recreational needs [29,69]. The destination’s functional characteristics may meet the tourists’ experiential needs and allow tourists to feel at home when they have a sense of place dependence on the destination [48]. This “home feeling” is because the spatial demands of tourists for a particular place triggers a sense of psychological ownership, and “home” could satisfy this demand [15,70].

Therefore, it is not difficult to understand that a destination may meet the experiential needs of tourists. When tourists regard a destination as a recreational base like their home, they might feel a sense of possession towards the destination, such as “my diving base” or “my secret hiking trail.” Based on these considerations, this research puts forward the following hypotheses:

Hypothesis 5 (H5). Place dependence has a direct and positive impact on DPO.

This study also asserts that DPO affects ERB. Peck and Shu [47] found that individuals may have positive emotions towards the ownership target when psychological ownership exists. Psychological ownership may allow individuals to regard the target as an extension of the self, inspiring in them a sense of responsibility and positive behavior towards the ownership target [48,71], such as ERB or place citizenship behavior [14]. When tourists have DPO, their sense of responsibility towards the destination is aroused, resulting in ERB, which is vital to the sustainable development of the destination. Accordingly, this study puts forward the following hypotheses:

Hypothesis 6 (H6). DPO has a direct and positive impact on ERB.
In the literature on marketing, scholars have confirmed the mediating role of psychological ownership in the relationship between individual perception and behavior (e.g., [72, 73]). Similarly, this study proposes that DPO may play a mediating role in the relationship between place attachment and ERB. Additionally, according to self-consistency theory, when the target’s characteristics are consistent with the individual’s self-concept, the individual’s psychological connection with the target may drive the his/her behavior [74–76]. As DPO is an important mechanism that reflects the psychological connection between tourists and destinations, place identity and place dependence should enhance tourist ERB through the formation of DPO. Accordingly, this study puts forward the following hypotheses:

**Hypothesis 7 (H7).** DPO may play a mediating role in the relationship between place identity and ERB.

**Hypothesis 8 (H8).** DPO may play a mediating role in the relationship between place dependence and ERB.

Integrating the above hypothetical relationships, this research proposes the theoretical model shown in Figure 1. In Figure 1, place identity and place dependence are the antecedent variables, ERB is the result variable, and DPO is the mediation variable.

![Theoretical model](image)

**Figure 1.** Theoretical model.

### 4. Methodology Measures and Instruments

#### 4.1. Measures and Instruments

##### 4.1.1. Place Attachment

This study used the two subconstructs concept (i.e., place dependence and place identity) to measure place attachment. The measurement of place attachment is based upon the place attachment scale established by Kyle et al. [12]; in this study, appropriate modifications were made according to the characteristics of diving activities to ensure that the content of the scale matched the meaning of such activities. In order to measure place attachment, there were four question items about place dependence and four about place identity. The measurement scale was based on Likert’s seven-point scale, ranging from “strongly disagree” (one point) to “strongly agree” (seven points). The items in the questionnaire are listed in Appendix A.

##### 4.1.2. Destination Psychological Ownership

To measure DPO, we applied the scale established by Kumar and Nayak [15]; in this study, appropriate modifications were made according to the characteristics of diving activities to ensure that the content of the scale matched the meaning of such activities. Three question items were included. The measurement scale was based on Likert’s seven-point scale, ranging from “strongly disagree” (one point) to “strongly agree” (seven points), for evaluation. The items in the questionnaire are listed in Appendix A.
4.1.3. Environmentally Responsible Behavior

In this study, regarding ERB, we applied the scale established by Li et al. [14]; appropriate modifications were made according to the characteristics of diving activities to ensure that the content of the scale matched the meaning of such activities. Five question items were included. The measurement scale was based on Likert’s seven-point scale, ranging from “strongly disagree” (one point) to “strongly agree” (seven points), for evaluation. The items in the questionnaire are listed in Appendix A.

4.2. Sample and Data Collection

The primary research subjects of this study were participants of scuba diving activities in Taiwan. The research scope included the main island and outlying islands of Taiwan. We applied a random sampling method to select and invite scuba divers who were qualified to fill out the questionnaire at diving sites, diving training centers, diving equipment stores and diving hotels.

To date, no minimum number of subjects required to accurately perform a structural equation model analysis has been given. However, when using the maximum likelihood estimation method (MLE) for parameter estimation, more than 150 samples is the minimum requirement [77]. Another common standard is Kerlinger and Lee’s suggested sample size for factor analysis research: the sample size should be at least ten times the number of questions [78]. Although scholars have different requirements for the number of samples, for rigor and conservativeness in the research, we estimated an effective recovery rate of 80%. The total number of measurement questions in the three constructs was 16. In this situation, our study estimated the number of valid, usable respondents to be 320 (20 times the number of question items). Therefore, this study distributed its questionnaire to at least 400 respondents. The survey period was from 10 July, 2020 to 30 September, 2020. Four hundred and fifty questionnaires were distributed, and 386 were returned, i.e., 85.78%. Questionnaires that did not meet the research standard, e.g., incomplete or invalid examples, were excluded. In total, 25 invalid and 361 valid responses were received.

In the sample of scuba divers interviewed, males accounted for 68.1%. In terms of age distribution, 52.6% of the subjects were 31–40 years old, accounting for the majority, followed by 21–30 years old, accounting for 22.4%. In terms of marital status, 56.2% were unmarried. In terms of education level, 36.6% of the subjects had a university degree. In terms of average monthly income, 33.5% of the subjects made 30,001 to 45,000 yuan. In terms of diving activities, 54.0% of the diving activities were undersea sightseeing, followed by underwater photography, which accounted for 22.7%. Scuba diving is a hazardous activity that requires long-term and professional training to reduce risks. Therefore, in terms of demographics, participants were mainly male (a spirit for challenges), young adults (a high level of physical fitness), unmarried (ample leisure time), had a monthly income of about 30,000 yuan, and had an advanced level of education (highly educated). In terms of diving activity, undersea sightseeing or underwater photography were the main activities, as sea hunting behavior has decreased in recent years.

5. Research Results

5.1. Reliability and Validity Analysis

This study used a confirmatory factor analysis to test the reliability and validity of each construct of the returned surveys. The results of each construct are shown in Table 1.
Table 1. Confirmatory factor analysis results.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Factor Loading</th>
<th>Cronbach’s Alpha</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place dependence</td>
<td>PA1_1</td>
<td>0.910 *</td>
<td>0.943</td>
<td>0.944</td>
<td>0.807</td>
</tr>
<tr>
<td></td>
<td>PA1_2</td>
<td>0.888 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PA1_3</td>
<td>0.895 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PA1_4</td>
<td>0.901 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place identity</td>
<td>PA2_1</td>
<td>0.875 *</td>
<td>0.924</td>
<td>0.924</td>
<td>0.754</td>
</tr>
<tr>
<td></td>
<td>PA2_2</td>
<td>0.878 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PA2_3</td>
<td>0.887 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PA2_4</td>
<td>0.832 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destination psychological ownership</td>
<td>DPO1</td>
<td>0.879 *</td>
<td>0.903</td>
<td>0.903</td>
<td>0.757</td>
</tr>
<tr>
<td></td>
<td>DPO2</td>
<td>0.873 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DPO3</td>
<td>0.858 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmentally responsible behavior</td>
<td>ERB1</td>
<td>0.916 *</td>
<td>0.960</td>
<td>0.960</td>
<td>0.829</td>
</tr>
<tr>
<td></td>
<td>ERB2</td>
<td>0.908 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ERB3</td>
<td>0.920 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ERB4</td>
<td>0.908 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ERB5</td>
<td>0.901 *</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cronbach’s α is often used to measure the degree of consistency between items within the same construct. Table 1 shows that the Cronbach’s α values of all constructs were between 0.903 and 0.960. The composite reliability (CR) of each construct was between 0.903 and 0.960, which showed that each had high reliability [79]. Next, the convergence validity of each construct was tested. Convergent validity mainly evaluates the extent to which each observation variable (indicator) of the primary construct can explain the meaning of the primary construct. There are two evaluation criteria for convergence validity. The first is that standardized factor loading belonging to the construct of each indicator must be greater than 0.5, and must have significance [80,81]. The second is that the average variance extracted (AVE) must be greater than 0.50 [79]. In this study, the standardized factor loading of each item of each construct was between 0.832 and 0.916, and the 16 observation variables all reached significance (t > 1.96). The AVE was between 0.754 and 0.829, which met the standard values suggested by the aforementioned scholars. Therefore, it could be judged that each construct had convergent validity.

Finally, the discriminant validity between the constructs was evaluated. When the square root of the AVE value of each construct was more significant than the correlation coefficient between other constructs, it meant that the constructs had discriminant validity [82]. Table 2 shows that the square root of each AVE construct in this study was greater than the correlation coefficient between other constructs. This result showed that the four constructs had discriminant validity.

Table 2. Correlation coefficient matrix of each construct.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PD</td>
</tr>
<tr>
<td>PD</td>
<td>4</td>
<td>0.899</td>
</tr>
<tr>
<td>PI</td>
<td>4</td>
<td>0.419 *</td>
</tr>
<tr>
<td>DPO</td>
<td>3</td>
<td>0.414 *</td>
</tr>
<tr>
<td>ERB</td>
<td>5</td>
<td>0.439 *</td>
</tr>
</tbody>
</table>

Note: PD = Place dependence; PI = Place identity; DPO = Destination psychological ownership; ERB = Environmentally responsible behavior. The diagonal bold italic values are the square roots of AVE. * = Equals significant at the 0.05 level (two-tailed).
5.2. Path Analysis and Hypotheses Testing

After the path analysis, the fitness index of this model was calculated as follows: in terms of absolute fitness indexes, \( \chi^2 / df = 1.261 (\chi^2 = 123.61, df = 98, p = 0.04) \), GFI = 0.959, AGFI = 0.943, RMSEA = 0.027, and SRMR = 0.029; in terms of comparative fit indexes, NFI = 0.978, NNFI = 0.994, and CFI = 0.995; in terms of parsimonious fit indexes, PNFI = 0.799 and PCFI = 0.813. The model fit analysis results showed that, except for the chi-square value, the absolute fitness indexes, comparative fit indexes, and parsimonious fit indexes all met the general academic requirements for model fit. Since large samples tend to produce an oversized chi-square value, the ratio of the chi-square value to the degree of freedom should be used for judgment, and this ratio should be less than 3 [79]. The chi-square value to the degree of freedom ratio in this study was less than 3 (1.261), i.e., was acceptable. These results showed that the overall fitness indexes met the standards of general academic research. Therefore, each research hypothesis in the theoretical model could be verified.

The causal relationship between each construct was found, as shown in Figure 2. Place dependence was shown to be able to directly and significantly affect place identity, with a path coefficient of 0.448. Both place dependence and place identity were shown to be able to directly and significantly affect ERB, with path coefficients of 0.197 and 0.267. These results showed that place identity had a higher influence effect on ERB. Both place dependence and place identity were shown to be able to directly and significantly affect DPO, with path coefficients of 0.269 and 0.400. Place identity also had a higher influence on DPO.

5.3. Mediating Effect Testing

Finally, we used the Sobel test to examine the mediating effect of DPO. After the impact effect of place dependence and place identity on ERB had been calculated, the Sobel test Z values of DPO were 3.647 (place dependence \( \rightarrow \) ERB) and 4.310 (place identity \( \rightarrow \) ERB), respectively, both reaching significance. Therefore, it could be determined that DPO plays a role in the relationship between place dependence, place identity, and ERB, which means that place dependence and place identity can directly and indirectly affect ERB through higher-level psychological mechanisms, such as DPO. Therefore, it was not difficult to determine the importance of DPO.

6. Discussion

6.1. Findings and Discussion

This study aims to explore the deeply psychological mechanisms that trigger tourists' ERB from the perspective of place attachment. Therefore, we focus on the mediating role played by DPO in the relationship between place attachment and ERB. Three major findings and a discussion are presented after an empirical analysis (structural equation modeling).

First, this research confirmed that both place identity and place dependence can directly affect ERB. This result is consistent with those in much of the literature [18,54]. Place identity and place dependence are the key factors affecting ERB. Therefore, the emotional connection between tourists and destinations should be strengthened when promoting
sustainable development [14]. Visitors ERB is also more likely triggered when visitors feel that a destination’s characteristics are consistent with their self-identity, compared to the place dependence oriented by the destination’s functionality. This triggering of ERB also shows that the substitutability [83] or non-exclusiveness of the destination in the concept of place dependence weakens tourist will to perform ERB. This result highlights the critical role of DPO in developing tourist ERB.

Second, this study also found that place identity and place dependence directly affect DPO, and that the influence of place identity is more significant than that of place dependence. This result is partly consistent with that of Kumar and Nayak [15]. Self-identity is an essential aspect of psychological ownership [14]. In tourism and recreation, destinations provide tourists with a source of self-identification, and tourists who have place identity naturally also have DPO [15]. Tourists can have a sense of dependence and belonging as if they were at home when they perceive that a destination meets their recreational experiential needs. Moreover, tourists will have a sense of possession of the destination, triggering a sense of psychological ownership, when they regard a destination as an exclusive, personal recreation base [15].

Finally, this study confirmed that DPO plays an intermediary role in the relationship between place attachment and ERB. In other words, place attachment influences ERB through a deeper psychological mechanism—the intermediary of DPO. The literature has not paid much attention to such a psychological process. Past studies have always focused on the direct influence of place attachment on ERB [18,19] while ignoring the deeper psychological mechanism between individuals and places. The concept of DPO may address this research gap. This study found that the mediating role of DPO helps to reveal the psychological process in which tourists consider themselves the “owner” of the destination [14]. This psychological process is driven by tourist identity and dependence on the destination, resulting in individuals believing that the destination is for their exclusive use, and therefore, actively taking responsibility for protecting its natural environment.

6.2. Theoretical Implications

In the fields of psychology and organizational behavior, scholars are generally aware of the importance of “psychological ownership” [84,85]. However, this concept remains in its infancy in tourism, recreation, and environmental psychology. To fill this research gap, respond to Kumar and Nayak [15], and enrich the literature on DPO, this study examined the structural relationship between place identity, place dependence, DPO, and ERB. The results emphasized the intermediary effect of DPO between place attachment and ERB. This research has therefore made some theoretical contributions. First, it re-examined the relationship between place attachment and ERB from the perspective of place identity and place dependence. This research found that as identification with the target is one of the main aspects of psychological ownership, place identity is more likely to inspire tourist ERB [14,15,48,52]. This result emphasizes the importance of DPO in promoting ERB.

Second, this research integrated the concept of DPO into the deep emotional structure of tourists and destinations, resulting in the clarification of the underlying mechanism of ERB. Place attachment was linked to ERB through DPO, which provided the new perspective of psychological ownership which can serve to reveal the triggering of ERB. This link is different from the focus of previous research on protection commitment and destination satisfaction when exploring the intermediary mechanism of ERB [20,54]. Our research explained the deeper psychological mechanisms and approaches through which place attachment triggers ERB from the DPO perspective. Tourists tend to regard a destination as their exclusive domain when they perceive that its characteristics are consistent with their self-identity, or that it meets their experiential needs. This sense of psychological ownership could help stimulate ERB. Moreover, because tourists sometimes feel that they are the “owner” of a destination, they more actively assume the responsibility of protecting the destination’s natural environment.
6.3. Managerial Implications

Goal 14 of the Sustainable Development Goals (SDGs) aims to conserve and sustainably use oceans and marine resources to ensure sustainable development by the year 2030, which should help to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty. Accordingly, first, the managers of diving recreation sites must consider which strategy ought to be implemented by adopting the results of this study in order to achieve the SDGs.

This study found that both place identity and place dependence can directly or indirectly stimulate tourist ERB. Therefore, managers should focus on constructing emotional connections between divers and diving sites, e.g., by conducting long-term marketing research to understand and improve divers’ identity and dependence on recreational sites, thereby enhancing tourist ERB.

Secondly, Baloglu and McCleary [86] stated that the cognitive and affective evaluation for recreational sites will help shape the destination image, and therefore, produce attachments to recreational areas [87]. As such, managers should reshape key elements that could affect the image of diving sites, including services, products, atmosphere, and facilities. Next, they can effectively convey this destination image to target tourists and compel divers to revisit the site by facilitating dialogue with tourists, resulting in enhanced consistency between the characteristics of recreational sites and the self-identity of tourists [21,88–90]. Further, managers should devote themselves to improving the relevant recreational resources of diving sites, enhancing the richness and differentiation of software and hardware to meet divers’ experiential needs [24]. Tourist ERB would be stimulated when place attachment to the diving sites is developed.

This study also found that DPO plays an intermediary role in the relationship between place identity, place dependence, and tourist ERB. Therefore, it is recommended that the managers of diving sites attempt to develop tourist DPO. Besides shaping the image of the diving site, promoting it, and increasing the resources needed to meet recreational needs, diving site managers are encouraged to take other useful measures, including planning various activities to enhance tourist participation [91] and giving tourists an unforgettable travel experience to cultivate their sense of ownership of the destination, thereby inspiring their sense of responsibility to protect the natural environment. Further, since the COVID-19 pandemic, e-commerce has surpassed offline transactions and “untact culture” has continued to expand. Therefore, the diving field is also facing a crisis. Diving site managers might need to think about whether to strengthen the DPO of tourists through online services [69].

7. Conclusions and Future Work

Although previous studies have generally agreed that place attachment affects ERB, and that this relationship is direct [5,18–21,54,56], few studies have attempted to explore how the two subconstructs of place attachment (place dependence and place identity) affect ERB and the mechanism by which this occurs. This study examined the structural relationships among place dependence, place identity, DPO, and ERB to fill this research gap. Although some of these relationships has been discussed in the literature, the structural relationships between these variables have not been examined simultaneously. We sought to clarify the previously proposed tourist behavior model by testing DPO. Therefore, this research contributes to the literature on sustainable tourism and behavior research.

Additionally, this research proposes the following recommendations for future research. First, the types of recreational activities might interfere with the relationship between place dependence, place identity, DPO and ERB. The mainly activity examined in this study was scuba diving. This activity is highly specialized; therefore, our analysis result might not be generalizable to all recreational activities, which is a limitation of this study.

Second, this study only sampled domestic tourists. Since the specific geographical context limits comparisons within different cultural contexts, our results may not apply
in other domains. Future studies should test the generalization potential of the model in other locations and using domestic and international tourists.

Third, due to the limitations of time, resources and manpower, this study only adopted a cross-sectional methodology, and did not apply a longitudinal methodology. Of course, it is relatively easy to explore the relationship among the various variables using a cross-sectional methodology, but interaction and the change process between place attachment and ERB in the time axis was not observed. Therefore, the use of a longitudinal methodology in follow-up research is recommended so that the interaction and change process of place attachment and ERB can be continuously tracked in the same place.

Fourth, in the measurement of emotional variables, this study adopted the self-report method. This type of evaluation may lack accuracy, since it is dependent on memories to record emotional reactions. Therefore, for the measurement of emotional variables, it is recommended that future researchers use more suitable methods, such as the experience-sampling (ESM) technique [92].

Fifth, in a diversified democratic society, it is not enough to rely solely on personal environmental responsibility to protect environmental resources [93,94]. Therefore, the diving industry or the government should promote the development of pressure groups or environmental protection groups to take action on environmental issues [95]. “The Clean Up the World Weekend,” advocated by Clean Up the World, an Australian international environmental protection organization, is an excellent example of such. This research only discussed the ERB of individuals, which is another limitation. Future research could explore tourist behavior in the organization.

Sixth, the mechanism that can trigger tourist ERB is not limited to the variables discussed in this study, such as place dependence, place identity, and DPO. On the contrary, ERB may also be influenced by other variables in the recreation process (such as recreational impact and recreational pressure). Further, the “early use” experience is an important influencing factor.

Seventh, the concept of integrated marketing has exerted long-term effects in various fields, and the marketing of environmental activities is insufficient in the field of recreation. Scholars could elaborate a complete mechanism of environmental behavior in various recreational areas based on the present findings in future research, and governments or the industry could develop more diversified environmental protection actions based on users’ recreational preferences.


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**Informed Consent Statement:** Written informed consent from the patients/participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

**Data Availability Statement:** The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation, to any qualified researchers.

**Conflicts of Interest:** The authors declare no conflict of interest.
Appendix A

Table A1. Questionnaire items in measurement scales.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Code</th>
<th>Measurement Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place dependence</td>
<td>PA1_1</td>
<td>I enjoy visiting this scuba diving destination more than visiting any other place</td>
</tr>
<tr>
<td></td>
<td>PA1_2</td>
<td>I get more satisfaction visiting here than visiting any other place</td>
</tr>
<tr>
<td></td>
<td>PA1_3</td>
<td>Visiting here is more important to me than visiting any other place</td>
</tr>
<tr>
<td></td>
<td>PA1_4</td>
<td>I would not substitute any other type of recreation for what I do here</td>
</tr>
<tr>
<td>Place identity</td>
<td>PA2_1</td>
<td>This scuba diving destination is meaningful to me</td>
</tr>
<tr>
<td></td>
<td>PA2_2</td>
<td>I identify strongly with visiting here</td>
</tr>
<tr>
<td></td>
<td>PA2_3</td>
<td>I am very attached to visiting here</td>
</tr>
<tr>
<td></td>
<td>PA2_4</td>
<td>I have a special connection to visiting here and other tourists who visit here</td>
</tr>
<tr>
<td>DPO</td>
<td>DPO1</td>
<td>I sense that this scuba diving destination is mine</td>
</tr>
<tr>
<td></td>
<td>DPO2</td>
<td>I feel personal ownership for this scuba diving destination</td>
</tr>
<tr>
<td></td>
<td>DPO3</td>
<td>I feel personally connected to this scuba diving destination</td>
</tr>
<tr>
<td>ERB</td>
<td>ERB1</td>
<td>I comply with the regulations to not destroy this scuba diving destination’s environment.</td>
</tr>
<tr>
<td></td>
<td>ERB2</td>
<td>I try not to disrupt the fauna and flora during my visit in this destination</td>
</tr>
<tr>
<td></td>
<td>ERB3</td>
<td>When I produce garbage during my visit in this destination, I put it in the trash.</td>
</tr>
<tr>
<td></td>
<td>ERB4</td>
<td>If there are environment improvement activities in this destination, I am willing to attend.</td>
</tr>
<tr>
<td></td>
<td>ERB5</td>
<td>I try to convince others to protect this destination’s natural environment.</td>
</tr>
</tbody>
</table>

References

11. Lewicka, M. Place attachment: How far have we come in the last 40 years? *J. Environ. Psychol.* 2011, 31, 207–230. [CrossRef]
42. Schultz, P.W.; Shriver, C.; Tabanico, J.J.; Khazian, A.M. Implicit connections with nature. J. Environ. Psychol. 2004, 24, 31–42. [CrossRef]
82. Fornel, C.; Larcker, D. Evaluating structure equations models with unobservable variables and measurement error. J. Mark. Res. 1981, 18, 39–50. [CrossRef]
83. Williams, D.R.; Patterson, M.E.; Roggenbuck, J.W.; Watson, A.E. Beyond the commodity metaphor: Examining emotional and symbolic attachment to place. Leis. Sci. 1992, 14, 29–46. [CrossRef]
88. Anton, C.E.; Lawrence, C. The relationship between place attachment, the theory of planned behaviour and residents’ response to place change. J. Environ. Psychol. 2016, 47, 145–154. [CrossRef]
89. Clarke, D.; Murphy, C.; Lorenzoni, I. Place attachment, disruption and transformative adaptation. J. Environ. Psychol. 2018, 55, 81–89. [CrossRef]