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How Climbers’ Sensation of Recreation Impact and Recreation Experience Affect Their Environmental Attitudes and Environmentally Responsible Behaviors: A Case of Jiaming Lake National Trail

Yun Wang 1,* and Chih-Chiang Wang 2

1 Department of Fashion Design and Management, National Pingtung University of Science and Technology, Pingtung 91201, Taiwan
2 Department of Forestry, National Pingtung University of Science and Technology, Pingtung 91201, Taiwan
* Correspondence: yunw@mail.npust.edu.tw

Abstract: The outbreak of COVID-19 has significantly increased the number of climbers who enter reserve areas and use mountain houses compared with the same period in 2019. Mountaineering has become a popular activity causing forest managers to pay more attention in tourist environmentally responsible behavior (ERB) which is key to maintain land sustainable management. Therefore, the purpose of this study is to explore the influence of climbers’ sensations of recreation impact, the recreation experience, and environmental attitudes on ERB in Jiaming Lake National Trail. Questionnaires were distributed online through a Facebook fans social network. A total of 577 valid questionnaires were received in July 2021, and we used SPSS20.0 and SmartPLS3.3.9 software to analyze returned questionnaires. The research found: 1. The recreation experience has a positive and significant impact on both environmental attitudes and ERB. 2. The recreational impact directly affects both the recreation experience and environmental attitudes with negative and positive consequences. 3. The recreation experience has a partial mediating effect on the relationship between recreational impact and environmental attitudes; 4. Environmental attitudes have a full mediation effect on the relationship between recreational impact and ERB. Our findings indicate that with a better recreation experience, hikers increase their positive environmental attitude and ERB. However, the recreational impact is contradictory in that it reduces the recreation experience which indirectly worsens hikers’ environmental attitude. Interestingly, the environmental attitude does not mediate the relationship between the recreation experience and ERB.

Keywords: recreation impact; recreation experience; environmental attitude; environmentally responsible behavior; Jiaming Lake National Trail; COVID-19; sustainability

1. Introduction

The COVID-19 epidemic swept across the world in 2020, causing serious damage to tourism. The Taiwanese government restricted entry and exit to prevent the epidemic from spreading, making it difficult to travel abroad, so people turned to domestic tourist activities instead. Since international travel was restricted, domestic tourists started to dominate the tourism market [1]. Nature-based tourism refers to travel that allows people to enjoy relatively undeveloped natural areas and is particularly popular because of the vast forest area and a lower risk of infection due to close contact with crowds. Taiwan is a long and narrow island with an area of 36,000 square kilometers. Located at the collision area of the Philippine Sea plate and the Eurasian plate, Taiwan has a rich variety of terrain, including basins, plains, hills and mountains. In addition, its density of mountains ranks first in the world. The diverse landscape provides a suitable environment for leisure activities and physical challenges, making mountaineering activities thrive in Taiwan [2]. Additionally,
mountain areas have the most visitors among the 342 tourist attractions in Taiwan [3]. It is the diverse type, low cost and benefits on both the physical and psychological sides that make mountaineering popular with Taiwanese people. An exercise survey conducted in 2018 showed that the ratio of people engaging in mountaineering activities climbed from 11.7% in 2017 to 12.1%, ranking third among all sports, and more than two million people enjoyed the fun of mountaineering [4].

Mountaineering, as a leisure activity, makes one stronger and healthier. Of all the famous mountain attractions in Taiwan, Baiyue (also known as 100 Peaks of Taiwan) is a goal that most climbers hope to achieve. The Jiaming Lake National Trail is one of the popular Baiyue hiking routes, with attractions such as Siangyang Mountain, Sancha Mountain, Jiaming Lake and Blackwater pond along the trail. Increasing rural tourism has created negative effects on landscapes, including environmental destruction, resource damage, improper use and overuse, waste accumulation, harmful emission release and overcrowding [5]. Irresponsible behaviors in mountaineering, such as walking on unpaved soil, taking shortcuts, using trekking poles resulting in soil erosion, exposing root and rock, interfering with wildlife and littering, can cause great harm to the environment. These disturbances of outdoor recreational sites have spawned a new discipline called recreation ecology that studies use and misuse of outdoor recreational sites [6]. In order to achieve environmental sustainability, government agencies often monitor and surveil wildlife, ecology, soil erosion, water quality and the impacts of outdoor recreation. The United Nations Environment Programme revealed that 4.8 million tons of trash is produced by tourist and hospitality consumers per year, with solid waste accounting for 14%, posing a serious threat to the environment [7]. Since climbers may accidentally cause damage to the natural environment, the number of visitors and their behaviors have also become important indicators of the mountain carrying capacity.

If tourists and visitors disregard the importance of environmental conservation, the biodiversity will gradually decrease [8]. Adopting pro-environmental behavior (PEB) can reduce environmental impacts in areas where tourist and hospitality consumers play major roles [9]. People who often participate in outdoor recreational activities accumulate more experience about nature and are often more concerned about the ecosystem and willing to adopt environmentally friendly behaviors [10]. Personal experience plays an important role in how information is processed through the comparison of past experience with a present situation. These experiences are particularly salient, as they can evoke strong emotions [11]. Although tourists may have a strong attachment to a place, a positive attitude toward the environment is still needed for environmentally responsible behaviors [12]. As active experiences become a larger segment of the tourism industry, research has found that the experience itself positively affects the level of satisfaction, showing that better visitor experiences further improve the managerial performance of a recreation area [13]. A research study used mixed methods of semi-structured interviews, quantitative questionnaires and ecological measurements of trail conditions to examine relationships between trail conditions and experiential elements. Results indicated trail conditions differed significantly based on four experiential elements in long-distance hiking of which the tread aesthetics were the most important experiential element [14]. Research by Ferguson et al. found that social, ecological, behavioral and sociodemographic characteristics of an area’s ecology significantly influenced visitor experience quality and decision making within the White Mountain National Forest in the USA [15]. Su et al. [16] examined why tourists develop environmentally responsible behavior (ERB) and found the application of management strategies are of crucial importance in reducing the ecological impact. Hence, it is important for recreation managers to observe the conflict between recreation and environmental protection from a visitor’s perspective, while striving for better performance and sustainable development. Some previous research found the ecological impact would influence tourist experience quality [14,15]; others found the recreation experience would influence their satisfaction [13]. This research will adopt the Stimulus–Organism–Response (S–O–R) model as a framework, viewing recreation impact as a stimulus, recreation experience and
environmental attitude as the organism, and tourist environmentally responsible behavior (ERB) as the response. To date, how outdoor recreational activities and experiences impact ERB has been under-researched. The relationships among the recreation impact, the recreation experience, environmental attitudes and ERB as they apply to long-distance hiking are not well understood. Therefore, this study aims to explore the relationships among the recreation impact, the recreation experience, environmental attitudes, and environmental behavior, with Lake Jiaming National Trail climbers as the target audience. The goals are as follows:

1. To examine how climbers’ recreational impact, recreation experience and environmental attitudes affect their environmentally responsible behavior.
2. To examine the mediating roles that the recreation experience and environmental attitudes play regarding the relationship between the recreation impact and environmentally responsible behaviors.

2. Literature Review

2.1. Mountaineering in Taiwan

Mountaineering mainly originated in 1760 when the Swiss physicist Horace Benedict De Saussure offered a bonus to those who reached the summit of the Alps or provided mountaineering routes in order to study alpine plants. Two world wars in the early 20th century largely halted the development of mountaineering. After the wars, there was renewed interest in mountaineering. In 1953, 39-year-old Nepalese guide Tenzing Norgay and 34-year-old Edmund Hillary from New Zealand, both members of the British mountaineering team, reached the peak of Mount Everest along the southern ridge, which marked the milestone of humans conquering the highest peak for the first time [17]. By 1964, all 14 peaks above 8000 m in the world had been climbed. With constant developments, mountaineering routes and techniques have grown more challenging and diversified. Mountaineering in Taiwan can be traced back to the period of the Japanese occupation. From 1926 to 1972, only associations such as the Chinese Taipei Alpine Association were allowed to scale the mountains. However, at the end of the Japanese occupation era, many high school students began to view mountaineering as a form of physical training or adventure [18]. Later, mountaineering teams flourished all around Taiwan, some established by companies and schools.

Taiwan is one of the islands with the highest density of mountains, and in order to promote mountaineering, the Chinese Taipei Alpine Association began to organize the Baiyue (also known as 100 Peaks of Taiwan) Club in 1970. After a list of 100 peaks was selected, climbing the Baiyue Mountains instantly became popular among Taiwanese mountaineering enthusiasts. Containing two Baiyue Mountains, the Siyangyang and Sancha, Jiaming Lake National Trail is located between Taitung Haiduan Township and Kaohsiung Taoyuan District. The total length of the trail is approximately 14 km, and its altitude is between 2400 m and 3600 m. Starting from the Siyangyang National Forest Recreation Area at the south, the trail goes along the ridgeline of Jiemaosi to Siyangyang and Sancha Mountains, then ends at Jiaming Lake. Jiaming Lake sits on a grassland on the southeast side of Sancha Mountain, at an altitude of 3310 m. It is the largest alpine lake in the southern section of the Central Range. Since Jiaming Lake sits near Siyangyang and Sancha Mountain and has fine facilities such as the Jiaming Lake Cabin and Siyangyang Mountain Cabin, it is one of the popular hiking trails when the rhododendrons of Jade Mountain bloom in May and June [19]. Little research has been conducted on long distance 2–3 days hiking on the Jiaming Lake National Trail.

2.2. Theory of Reasoned Action and Theory of Planned Behavior

According to the theory of reasoned action (TRA), an individual’s behavioral intention, which is an immediate precursor of actual action, is constructed by his/her attitude toward the behavior and subjective norm [20]. In response to the limitations of the TRA, Ajzen proposed a new model, the theory of planned behavior (TPB), by adding perceived behav-
ioral control [21]. The TPB postulates that predictors of behavior (e.g., pro-environmental behavior) are behavioral intentions influenced by attitudes, subjective norms and perceived behavioral control. In the past few decades, research on environmental psychology and social and tourism behavior have mostly adopted the TRA and TPB as the concepts to explain consumer pro-environmental behavior [22–25]. A systematic review on pro-environmental behavior in tourism and hospitality which extracted research papers between 2002–2020 concluded that TPB was the most utilized concept [24].

2.3. Environmental Attitudes

Attitudes toward behavior are the degree to which practicing a certain behavior is favorably/unfavorably valued [20]. Thus, Kaiser et al. [26] suggest that people with favorable views of environmental preservation simultaneously hold favorable views of the natural environment and activities in nature. Environmental attitudes are closely related to an individual’s learning experiences; they are the feelings one experienced and sensed in the natural environment, and the physiological and psychological responses to a specific thing related to the environment, including all preferences and evaluations. Wang et al. conducted a comparative study of cognitive and affective attitudes on tourist pro-environmental behavioral intentions (TPEBI) and found affective attitudes have a significant influence on TPEBI, but cognitive attitudes do not [27]. A study combining TPB and the cognition–affect–behavior model found attitudes toward the behavior, subjective norms, perceived behavioral control, unique destination fascination and tourist delight have a direct influence on TPEBI, with tourist delight positively mediating the relationship between unique fascination and TPEBI [23]. Additionally, research on Iranian climbers found that perceived behavioral control had the strongest association with pro-environmental behavioral intention (PEBI), subjective norms had a moderate positive effect on behavioral intention, and attitude had a small positive effect on intention [25]. However, reaching opposite conclusions on the role of attitude, research adding media use and environmental knowledge into the TPB found that perceived behavioral control, subjective norms, and environmental knowledge were positively associated with pro-environmental intentions (PEI). Furthermore, pro-environmental intentions, perceived behavioral control and media have a direct effect on PEB; however, attitude has no direct effect on either PEI or PEB [28].

2.4. Tourist Environmentally Responsible Behavior (TERB)

Sollberger believes that pro-environmental behavior (PEB) is an act that aims to mitigate the negative impact humans have on the natural environment. Factors contributing to tourists’ inappropriate environmental behavior include lack of knowledge, lack of skill, negligence and intentional violation of the law [29]. Research explores how tourist pro-behavioral intentions (TPEBI) represent actual behavior by applying the TPB [22,23,25]. Research shows that PEB covers a wide range of issues, such as meeting demand, improving environmental sustainability and resource efficiency. It reduces negative environmental impacts during or after a tourist trip, contributing to the protection of the environment and the well-being of the visited area [22–24]. Some studies [28,30] have generally applied TERB interchangeably with TPEB (tourist pro-environmental behaviors) which refers to various actions’ tourists take to reduce negative effects on the natural environment during their trips.

Most relevance research has focused on examining various tourist-related factors as antecedents or mediators of TERB, such as tourists’ environmental attitudes, subjective norms and perceived behavior control [23,25,27], the recreation experience [31], reputation and satisfaction [32], the destination’s image [33] and emotional solidarity with hosts [30]. To reduce the amount of litter in tourist destinations and encourage environmentally responsible behavior which would contribute to the tourist destinations’ sustainability, researchers argue that rewarding environmentally responsible behavior and understanding the antecedents are crucial for the sustainable development of tourist destinations [34].
2.5. Recreation Experience

Holbrook and Hirschman applied experiential perceptions to understand customer behavior [35]. Experiences are feelings that people have when they participate in an event [36]. Recreational experience is the way a tourist attraction transmits its value through experience [37]. An individual’s evaluation and experience in tourist attractions will enhance their recreation experience [38]. Chen divided the recreation experience into components such as level of satisfaction, memory combination, preference, motivation, demand and intention, and the development of each step varies with the surrounding environments, goals and attitudes of an individual [39]. Ballantyne, Packer and Falk [40] proposed the wildlife tourism experience comprising experiential engagement and reflective engagement. Research suggests when people participate in nature-based tourism, their recreation experiences can strengthen their sense of engagement in both general and site-specific environmentally responsible behavior and contribute constructively to positive aspects of sustainable tourism [41]. A longitudinal research study on the influence of the tourism experience on environmental attitudes and behavior in China found that environmental attitude scores post-visit and during a follow-up visit had no significant difference. Therefore, they suggest that the tourism experience has little effect on tourists’ environmental attitudes, and the tourism experience has a significant impact on both the general and site-specific tourists’ environmental behavior [42].

2.6. Recreational Impact

When recreation use is spatially concentrated, the impact on ecological components due to recreation use result in soil erosion, root and rock exposure and litter [5]. The Buckley recreational impact refers to the rapid changes of society and the environment caused by recreational activities, which can be divided into positive and negative impacts. Positive impacts mainly include increased employment and the benefits tourism brings, while negative impacts include environmental pollution and degradation. For instance, trampling on lawns can result in bare roots or soil and cause soil erosion or damage to roots. In addition to overcrowding and causing conflict, frequent use of recreational areas may result in damage or extinction of species and affect natural habitats and the ecosystem [43]. Hsieh and Yang pointed out that many national parks have faced degradation of natural areas from outdoor recreation, including facility, social and ecological impacts [44]. COVID-19 caused various social, ecological and situational impacts upon visitor experiences, natural resources and local communities [45] (p. 829). Experiencing a negative and unexpected outcome spurs people to search for its cause, One research study found personal experience, concern and subjective knowledge are associated with climate change which in turn is related to pro-environmental attitudes and behavioral intentions [46]. Hence, in order to understand how hiker experiences impact recreation attraction and understand how experiences influence their recreation experience and ERB, this study selects the recreation impact as a variable to evaluate the actual impact level.

3. Research Hypotheses and Theoretical Model

3.1. The Directing Effect of Recreation Experience, Recreation Impact and Environmental Attitude

Duerden and Witt suggested that both direct and indirect nature experiences would improve environmental attitudes, and attitudes were more strongly associated with behavior [47]. Tourists’ experiences in nature enhance their environment friendly behaviors and perception of nature [48]. Others suggest when people participate in nature-based tourism, their recreation experiences can strengthen their sense of engagement in environmentally responsible behavior and contribute constructively to positive aspects of sustainable tourism. Moreover, their environmental attitudes are also significantly positive relating to tourist behavior and mediate the relationship between the recreation experience and environmentally responsible behavior [41]. Wang and Chen took environmental education course students as the research subject and found that place attachment indirectly affects environmental behavior through environmental attitudes. Environmental attitude
plays the role of an intermediary, indicating that responsible environmental behaviors need to be generated through positive environmental attitudes despite having a strong place attachment [12]. Recreation in beach tourism found tourists’ environmental attitudes positively affect their environmentally responsible behaviors [49]. Consistent with research using TPB, the research of Wong et al. found positive attitudes toward green events from favorable beliefs generating a positive motivational force to drive pro-environmental behaviors through personal values [50]. Consequently, we hypothesize the following:

**Hypothesis 1 (H1).** Recreation experience positively and significantly relates to environmental attitude.

**Hypothesis 2 (H2).** Recreation experience positively and significantly relates to ERB.

**Hypothesis 3 (H3).** Environment attitudes are positively and significantly related to ERB.

Outdoor recreation tends to impact ecosystem functions, which can affect the quality of the outdoor recreation experiences as well as the integrity of recreational resources [6]. Personal experience from extreme weather was positively associated with attributing events to climate change [46]. It could be the case that these personal experiences are related to pre-existing values and attitudes through processes of reasoning [51]. Based on previous research findings, we propose the following hypothesis.

**Hypothesis 4 (H4).** Recreation impact negatively and significantly relates to the recreation experience directly.

**Hypothesis 5 (H5).** Recreation impact positively and significantly relates to environmental attitude directly.

### 3.2. The Mediating Effect of Recreation Experience and Environmental Attitude

Two theories might offer insights for our research framework—the cognitive appraisal theory [52] and the stimulation–organism–response (S–O–R) theoretical model [53]. According to the cognitive appraisal theory, cognitive appraisal occurs between external stimulation and emotional response. Individual cognitive appraisal of an external stimulation would trigger the emotional response and then lead to individual responsive behavior, consistent with an appraisal–emotion–response path [54]. In other words, in the presence of external environmental stimuli such as the recreation impact a tourist perceived on the trip, tourists will produce a cognitive appraisal of the stimuli, which will create the recreation experience and favor/unfavored attitude, and hence their behavioral responses. Meanwhile, the S–O–R theoretical model can also effectively explain the structure above. S–O–R hypothesizes that external stimuli affect the internal state and hence the subsequent behavior [53]. This model also reveals the mediating role of the internal psychological state between the external stimuli and the behavior.

Previous research applying the S–O–R model as a theoretical framework found that the effect of destination source credibility on TERB in tourism was partially and sequentially mediated by place attachment and destination image [55]. Additionally, Cheng and Chen found cultural attachment plays a partially mediating role between cognitive, emotional and cultural experiences (tourism experience) and TERB [56]. Consequently, the S–O–R model provides a theoretical basis for establishing a mediating transmission mechanism between tourists’ experience and the behavioral response. Based on the S–O–R model, we propose recreation impact as the stimulus, experience and environmental attitude as the organism and ERB as the response. Therefore, we consider the following hypotheses:

**Hypothesis 6 (H6).** Environment attitudes mediate the relationship between the recreation experience and ERB.
Hypothesis 7 (H7). Recreation experience mediates the relationship between the recreation impact and ERB.

Hypothesis 8 (H8). Environment attitude mediates the relationship between the recreation impact and ERB.

Integrating the above hypothetical relationships, this research proposes the theoretical model shown in Figure 1. The recreation experience and the recreation impact are the dependent variables, environmental attitude is the mediation variable, and ERB is the dependent variable.

Figure 1. Research framework.

4. Methodology Measures and Instruments

4.1. Measures and Instruments

All constructs were measured using items adapted from previous studies. All measurements used a 5-point Likert scale with response options ranging from 1—strongly disagree to 5—strongly agree. Recreation impact was measured with three aspects: facility management impact, social psychology impact and ecological environmental impact for 13 items [57]. Recreation experience was based on the concept of 5 senses with a total of 6 items [58]. Environment attitude was divided into three dimensions: conquering nature, balance of nature and development constraints with a total of 9 items [59], and ERB was measured with 6 items [60]. Research indicators for each construct are listed in Appendix A, Table A1.

4.2. Sample and Data Collection

The subject of this study is the climbers of Jiaming Lake National Trail. Paper questionnaires were originally planned, but due to the epidemic, online questionnaires were used instead. In July 2021, the questionnaire link was posted on the “Love in Jiaming Lake” Facebook fan page and the “Things about Jiaming Lake” Facebook. A bottle of soy sauce from National Pingtung University of Science and Technology as an incentive prize was given for filling in the questionnaire. A total of 582 copies were retrieved. We eliminated 5 invalid ones from graduate students and faculty members, which were used for testing. There were 577 valid questionnaires in total, with a return rate of 99.1%. Among the 577 respondents, most were female (289 people, 50.1%), aged between 26 to 40 (273 people, 47.4%) and had a college degree (58.4%). Of the respondents, 70.7% (408 people) had visited Jiaming Lake for the first time. Those who visited Jiaming Lake in 2019 and 2020 made up 44.0% of the total sample (254 people).

5. Research Results

Data were analyzed by using Smart Partial Least Squares (PLS) 3. The PLS model is analyzed and interpreted in two stages. First, the adequacy of the measurement model is assessed by evaluating the reliability and the validity of the constructs by applying
standard decision rules. Then, path analysis in the structural model is evaluated with paths coefficients, $R^2$, $f^2$, and $q^2$. Path coefficients indicate the strength of direct relationships between constructs. The determination values of coefficient ($R^2$) are approximately 0.670 substantial, around 0.333 average and 0.190 weak. The effect size ($f^2$) and ($q^2$) measures if an independent variable has a substantial impact on a dependent variable and has values between 0.020–0.150, between 0.150–0.350 and exceeding 0.350, indicating a small, medium and large effect, respectively, [61–63].

5.1. Measurement Model’s Reliability and Validity

The research stated composite reliability (CR) and Cronbach alpha of constructs have to be larger than the proposed threshold 0.70 [64]. Convergent validity was obtained by: (1) Each indicator’s standardized factor load belonging to the construct must be greater than 0.5, and significant. (2) The average variance extracted (AVE) needs to be larger than the proposed threshold 0.50. Discriminant validity was obtained from the square root of AVE and was greater than the correlations between the construct and other constructs in the model [65].

The reliability and validity results of the constructs are shown in Table 1. Cronbach’s $\alpha$ values of all constructs were between 0.822 and 0.929, and the CR of each construct was between 0.875 and 0.944, which showed that each construct had high reliability [61]. The convergent validity for constructs was obtained from all items’ standardized factor loading of each construct which was between 0.719 and 0.900, and $p$ values were all significant ($p < 0.001$). In addition, constructs AVE were between 0.584 and 0.738. Therefore, each construct had convergent validity. Finally, the constructs had discriminant validity; Table 2 shows that the square root of each AVE construct was greater than the correlation coefficient between other constructs.

Table 1. Confirmatory factor analysis results.

| Construct            | Item     | Factor Loading | $\alpha$ | CR   | AVE  |
|----------------------|----------|----------------|----------|------|------|
| Recreation Experience| RE1      | 0.878***       | 0.929    | 0.944| 0.738|
|                      | RE2      | 0.825 ***      |          |      |      |
|                      | RE3      | 0.864 ***      |          |      |      |
|                      | RE4      | 0.868 ***      |          |      |      |
|                      | RE5      | 0.900 ***      |          |      |      |
|                      | RE6      | 0.816 ***      |          |      |      |
| Recreation Impact    | RI11     | 0.786 ***      |          |      |      |
|                      | RI12     | 0.824 ***      |          |      |      |
|                      | RI13     | 0.815 ***      |          |      |      |
|                      | RI8      | 0.719 ***      | 0.848    | 0.891| 0.622|
|                      | RI9      | 0.794 ***      |          |      |      |
| Environment Attitude | EA4      | 0.778 ***      |          |      |      |
|                      | EA5      | 0.823 ***      |          |      |      |
|                      | EA6      | 0.760 ***      |          |      |      |
|                      | EA7      | 0.732 ***      | 0.822    | 0.875| 0.584|
|                      | EA8      | 0.725 ***      |          |      |      |
| Environment Behavior | EB1      | 0.804 ***      |          |      |      |
|                      | EB2      | 0.866 ***      |          |      |      |
|                      | EB3      | 0.817 ***      |          |      |      |
|                      | EB4      | 0.867 ***      |          |      |      |
|                      | EB5      | 0.858 ***      |          |      |      |
|                      | EB6      | 0.806 ***      | 0.914    | 0.933| 0.700|

Note. *** $p$-value <0.001; $\alpha$ = Cronbach’s $\alpha$; CR = composite reliability; AVE = average variance extracted.
Table 2. Fornell–Larcker discriminant validity.

| Construct | RI   | RE   | EA   | ERB  |
|-----------|------|------|------|------|
| RI        | 0.788| -0.112| 0.859|      |
| RE        | 0.147| 0.317| 0.764|      |
| EA        | -0.052| 0.586| 0.358| 0.837|

Note. RE = recreation experience; RI = recreation impact; EA = environment attitude; ERB: environmentally responsible behavior. The diagonal bold values are the square roots of AVE.

5.2. Path Analysis and Hypotheses Testing

The structural model and hypotheses were evaluated after reaching a validated measurement model. The causal relationship between each construct was found, as shown in Figure 2. Both the recreation experience and the recreation impact influenced environmental attitude directly and significantly with path coefficients of 0.338 and 0.187. These results show that the recreation experience had a higher influence effect on EA. Both the recreation experience and environmental attitude were shown to have significant effects on EB, with path coefficients of 0.525 and 0.192. Once more, the recreation experience had a higher influence on EA. Table 3 presents assessment results which indicated we had average explanatory power for environmental behavior ($R^2 = 0.376$) and were weak for environmental attitude ($R^2 = 0.135$) and the recreation experience ($R^2 = 0.012$). The effect size ($f^2$) of each path in our research was counted for small effect. Only the recreation experience to EB had medium effects. Our $q^2$ predictive power indicated that the recreation impact only has small to medium predictive power, ranging from 0.008 to 0.232. These results show that the overall fitness indexes met the standards of general academic research. Therefore, each research hypothesis in the theoretical model could be verified.

Figure 2. Research model and results of hypotheses test.
Table 3. Assessment results of research model.

| Research Hypotheses | Relation | Path Coefficients | t       | Decision | R²   | f    | q²   |
|---------------------|----------|-------------------|---------|----------|------|------|------|
| H1                  | RE → EA  | Positive          | 0.338 ***| 7.245    | Support | 0.135 | 0.13 | 0.067 |
| H5                  | RI → EA  | Positive          | 0.185 ***| 4.242    | Support | 0.04  | 0.023 |
| H2                  | RE → ERB | Positive          | 0.521 ***| 12.211   | Support | 0.376 | 0.397 | 0.232 |
| H3                  | EA → ERB | Positive          | 0.196 ***| 4.951    | Support | 0.053 | 0.030 |
| H4                  | RI → RE  | Negative          | −0.112 * | 2.279    | Support | 0.012 | 0.012 | 0.008 |

Note. RE = recreation experience; RI = recreation impact; EA = environment attitude; ERB: environmentally responsible behavior. *** p-value < 0.001; * p-value < 0.05.

5.3. Mediating Effect Testing

The Bootstrapping method was used to verify the existence of the mediating effects of the recreation experience and environmental attitude. When evaluating the mediating effect, the variance accounting for (VAF value) can be used. The meaning of the VAF value is the proportion of indirect effects to the overall effect. VAF values < 20% indicate no mediation effect; 20% < VAF values < 80% indicate partial mediation; VAF values > 80%, indicate complete mediation [61]. Refer to Table 4 and Research Hypothesis 6. Both the direct and indirect paths were significant among relationships of the recreation experience, environment behavior and “environmental attitude” through the path of the mediating variable. However, the VAF value is 11.2% which is lower than the threshold of 20%; therefore, the mediation effect is not significant. For Research Hypothesis 7, with the recreation experience as the mediating variable, the path between RI and EA is significant, and its VAF value is −46.83%, so there is a partial mediating effect of the recreation impact through the path from the recreation experience to environmental attitude. For Hypothesis 8, the direct effect of RI to EB was not significant, and when you include the mediator-EA, the path becomes significant, and the VAF is larger than 80%, indicating complete mediation.

Table 4. Mediation effect test.

| IV | Mediator | DV   | Direct Effect (t Value) | Ind. Effect (t Value) | Total Effect | VAF   | Decision |
|----|----------|------|-------------------------|-----------------------|--------------|-------|----------|
| H6 | RE       | EA   | 0.525 *** (12.401)      | 0.066 ** (3.456)      | 0.586        | 11.2% | Not support |
| H7 | RI       | RE   | 0.187 *** (4.242)       | −0.059 * (2.242)      | 0.126        | −46.83% | Partial Medi. |
| H8 | RI       | EA   | −0.028 (0.684)          | 0.036 ** (3.092)      | 0.014        | 257%  | Full Medi. |

Note. * p < 0.05; ** p < 0.01; *** p < 0.001; Ind. = indirect; Medi. = mediation.

6. Discussion

6.1. Findings and Discussion

There was no gender difference among the climbers; they were mainly middle-aged college graduates. Most of them work in the service industry and were visiting Jiaming Lake for the first time. This is probably because most experienced climbers have scaled Baiyue Mountains and gone on to other peaks. The majority of our respondents climbed in 2019 and 2020, before the pandemic. Most climbers have scaled 3 to 10 Baiyue Mountains. Most climbing teams are made up of three to eight friends and relatives who take care of each other during the climb, which usually takes three days and two nights. These climbs tend to be leisure activities, with a trained porter to make the climbing smoother and avoid many unexpected situations.
This study aims to explore the ecological impact from a tourist point of view by examining how the recreation impact affects their decision making in ERB through the recreation experience and environmental attitudes. After an empirical analysis, major findings are showed in Table 4 and described in the following sections.

6.1.1. RE-EA-ERB Relationships

First, this research confirmed that both the recreation experience and environmental attitude can directly affect ERB and that the influence of the recreation experience is more significant than environmental attitude. These results are consistent with previous research by Lee et al. [41], Hong et al. [42] and Liu et al [49]. The authors in [49] provide research with slight differences in the environmental attitude roles. Previous research confirmed that when people participate in mountaineering, their recreation experiences can strengthen their environmental attitude and reinforce their commitment to engage in environmentally responsible behavior, which contributes to sustainable tourism. However, our research found the mediating role of environmental attitude was not significant since the variance accounting for the indirect effect (VAF value) was small. While hiking the trail, climbers are interacting with nature which increases joy for life and releases stress. At this moment, their environmental attitude for the nature/human conflict is not that important, and their ERB arises spontaneously. This result highlights the importance of the recreation experience on tourist ERB.

6.1.2. RI-RE-EA Relationships

Second, the study found that the recreation impact negatively influences the recreation experience; and the recreation experience has a partial mediating effect between the link of the recreation impact and environmental attitude. It confirmed that the effect of environmental attitude would be diminished, while the hikers were perceiving the recreation experience through the recreation impact (H7). These results are consistent with research that outdoor recreation results in impacts to ecosystem functions, processes and aesthetics, which reduce climbers’ perception of the quality of the experiences [15,45]. Our results indicate that the tourist recreation experience plays a salient role since it can evoke strong emotions and ultimately influence the tourist’s attitudes and behavior; however, if the tourist senses destructive ecological recreation impact, the tourist recreation experience would decrease which would eventually influence their environmental attitude and leisure satisfaction. The mechanism is the same as the appraisal–emotion–response and S–O–R models, while the presence of external environmental stimuli will produce a cognitive appraisal of the stimuli, which triggers an emotional recreation experience.

6.1.3. RI-EA-ERB Relationships

Third, the study found that the recreation impact positively affects tourist environmental attitude, and there was a full mediating effect between the recreation impact and ERB. More interestingly, the environmental attitude is fully mediated in the relationship between climbers’ recreation impact and the ERB (H8), showing the importance of tourist environmental attitude to ERB. The results demonstrate how value orientations are mediated by attitudes affecting behavior [49]. Among the different research studies successfully using the S–O–R model in their TERB application [55,56], our results also effectively demonstrated that the structure of the S–O–R model is appropriate when examining how external stimuli of the recreation impact would affect the internal state of environmental attitude and the subsequent behavioral response. Our research reveals the full mediating role of the internal psychological state of environmental attitude between the recreation impact and the TERB.

The Jiaming Lake National Trail does not regulate the number of visitors. COVID-19 brought a huge influx of visitors and altered perceptions of the forest ecology because the tourists noticed all of the signs of human visitation: soil erosion, damaged roots, littering and noise pollution. Many of these tourists had negative recreation experiences which,
according to our research findings, had a direct influence on their environmental attitude, but not on ERB. On the other hand, a positive recreation experience directly influenced their ERB. This finding assumes that after a negative experience from the recreation impact, people intend to think through their cognition process and produce their attitude which then indirectly affects their ERB.

7. Conclusions and Future Work

Since 2020, COVID-19 has increased the workload of mountain rangers. In 2020, the number of climbers who entered the reserve area and used mountain houses had increased by 57% compared with the same period in 2019. However, the parks were not prepared for such an influx of visitors, nor were the new climbers prepared for wilderness treks. The ecological impact was huge. Currently there are only 1084 staff members overseeing more than two million hectares of forest area in Taiwan. On average, a mountain ranger is responsible for about 26 hectares which is 50 times the area of Da An Forest Parks in Taipei city [66]. This research assists understanding leisure tourist perceptions of popular outdoor recreation areas. Since the rapid increase in mountaineering has created negative environmental impacts, Forestry Bureau management policies have become an important factor in protecting the ecosystem of the forests. Our first suggestion is to limit the number of climbers. Another suggestion is to provide more support for park staff and increase awareness of the consequences of environmentally irresponsible behavior. Forestry Bureau advocacy should encourage climbers to take environmental courses ahead in mountaineering and inform them of the dangers. Additionally, the government should increase recruiting efforts for mountain rangers. The current Forestry Bureau policy was set up before COVID-19 and is inadequate.

Our results should be evaluated with caution. This study only investigated mountaineering during the COVID-19 pandemic and did not study all possible user groups for ecological impacts. Future research can examine antecedent factors of the important role of environmental attitude which has a direct influence on ERB and full mediation between negative ecological impact and ERB. Additionally, longitudinal and qualitative research of the different aspects of mountaineering tourism may uncover more puzzles which are relevant for our sustainable forests.

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

Table A1. Questionnaire items in measurement scales.

| Construct            | Code | Measurement Item                                                                 |
|----------------------|------|-----------------------------------------------------------------------------------|
| Recreation Impact    | RI8  | When I stop in Jiaming Lake or Triangle Point, there is noise from people          |
|                      | RI9  | I noticed rubbish, peels or food waste thrown away                                 |
|                      | RI11 | I noticed that someone is disturbing the wild animals                             |
|                      | RI12 | I found that along the road there are paths that tourists take as shortcuts       |
|                      | RI13 | I noticed that the plants on both sides of the trail were trampled and the roots were exposed |
| Recreation Experience| RE1  | This mountaineering made me feel relieved from stress                             |
|                      | RE2  | This mountaineering made me feel emotionally stable                               |
|                      | RE3  | This mountaineering brought me closer to my companions                            |
|                      | RE4  | This mountaineering allowed me to interact with my companions well                |
|                      | RE5  | This mountaineering has added more joy to my life                                 |
|                      | RE6  | This mountaineering made me settle my mind                                       |
| Environment Attitudes| EA4  | According to the current situation, human beings will soon face environmental disaster |
|                      | EA5  | Humans are destroying and abusing the environment                                 |
|                      | EA6  | To survive, human beings must learn to live in peace with nature                  |
|                      | EA7  | The resilience of nature cannot withstand the destruction of modern industrial society |
|                      | EA8  | We must control industrial development to maintain the health of the environment |
| ERB                  | ERB1 | If I need to use the toilet in the wild, I will try to stay away from water sources and trail areas |
|                      | ERB2 | I will put my belongings away so as not to hinder the movement or rest of other tourists |
|                      | ERB3 | I will take pictures to document the outdoor experience and not take things back to commemorate |
|                      | ERB4 | When observing wildlife, I keep my distance and avoid feeding them                |
|                      | ERB5 | Before I go out, I will check the environment and regulations of the destination area |
|                      | ERB6 | In case of emergency, I will have the proper equipment and know how to use it     |

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