Study on Ecological Value Co-Creation of Tourism Enterprises in Protected Areas: Scale Development and Test

Kang Nie *,† and Xiaojing Tang †

School of Business, Sun Yat-sen University, Guangzhou 510275, China
* Correspondence: niek5@mail2.sysu.edu.cn; Tel.: +86-1372-544-4150
† These authors contributed equally to this work.

Abstract: The ecological value co-creation of protected areas needs to be constructed in a multi-dimensional way. By referring to relevant foreign and domestic literature reviews, it is found that value co-creation theory has not been applied in eco-tourism research yet. The ecological value of protected areas is a combination of environmental value, social value and economic value. Stakeholders in protected areas including the government, stewardship agency, local community, tourism enterprises, tourists and so on interact with each other with different interests and have an impact on the ecosystem, eventually influencing the whole ecological value of protected areas. Among them, tourism enterprises play an important role and function as a double-edged sword. On one hand, they bring human resource, logistics, capital flow, information flow and energy into the ecosystem to create social and economic benefits. On the other hand, they pursue maximum profits which may cause the irreversible destruction of natural resources. The fact that all the stakeholders rely largely on natural resources and the other stakeholders makes ecological value co-creation become the possible best solution for the sustainable development of protected areas. The key is to study the characteristics and patterns of value co-creation behaviors of those tourism enterprises; thus, its scale development is of great importance. On the basis of the literature review and in-depth interviews with stewardship agencies and tourism enterprises in protected areas, this study develops a scale of ecological value co-creation behaviors from the perspective of small tourism enterprises. Then, with an investigation of tourism enterprises in protected areas, it validates ecological value co-creation behaviors by exploratory factor analysis and confirmatory factor analysis. The results show that tourism enterprise ecological value co-creation behavior is a construct consisting of four dimensions: environmental citizenship behavior, dialogue and communication behavior, knowledge-sharing behavior and co-petition behavior, which could be measured by 12 items. The reliability and validity test presents good internal consistency, reliability, convergent validity, and discriminant validity of the scale. In the end, the relationship of interdependency between tourism enterprises and other stakeholders in the protected area with ecological value co-creation behaviors is examined, which shows good predictive validity of the scale. Given these results above, this scale can not only be used as a measuring tool in future research but can also be provided as a reference to authorities to manage the tourism enterprises in protected areas. Finally, the study discusses the limitations and future research directions.

Keywords: protected areas; ecological value; symbiosis theory; eco-value co-creation

1. Introduction

Protected areas are a key strategy for conserving biodiversity and maintaining ecosystem services to constrain human exploitation of the natural environment and achieve conservation of natural ecology. The first protected areas were established in 1872 at Yellowstone national park in the USA. In the past 25 years, the scope of protected areas has expanded and now occupies 13% of the world’s total area [1]. In the International Union for Conservation of Nature (IUCN) definition, protected areas have the dual mandate...
of “conservation” and “use” [2,3]. In addition to maintaining biodiversity and essential ecosystem services, protected areas are mandated to fulfill their “use” mission by providing space for recreation and tourism [4,5]. In total, 93% of natural WorldHeritage sites provided recreation and tourism benefits in 2021 [6]. The ecological value of protected areas is therefore not only the value of their existence for the preservation of human existence but also the value of the ecological service that they provide to meet human needs by providing services such as climate regulation, water conservation, biodiversity conservation, and travel and leisure [7]. From a macro perspective, ecosystems are an important prerequisite and necessary condition for human survival and development, and they have an obvious and important environmental value for humans [8]. By quantifying and visualizing the information on the ecological value of a conservation area, after scientific packaging and design, it can be transformed into an educational product and a tourism product, reflecting economic value and social value [9]. Thus, ecological value is an overall value that encompasses environmental value, economic value and social value.

Ecological tourism in protected areas has its own special characteristics. It is a form of sustainable tourism that is based on natural resources and emphasizes conservation, development and education under strict planning, management and regulation with the participation of protected areas, local government, tourism enterprises, tourists, local communities and other stakeholders [10,11]. As one of the main responses to the lack of financial resources, many protected areas are actively using their excellent natural environment and resources to develop ecological tourism activities, expanding the intensity and scope of development as well as increasing the number of tourists received year by year [12,13]. These enterprises have become a very important element of tourism, with an important service function, which are an integral part of ecological tourism in protected areas [14,15].

The importance of tourism enterprises is not only due to their numerical dominance but also because they play an important role in the sustainable development of tourism destinations [16–18]. Rodenburg, a pioneer scholar who really sparked the academic interest in tourism enterprises, found that tourism enterprises were more effective than large-scale enterprises in achieving economic goals such as increasing revenue, foreign exchange, investment, employment opportunities, and reducing negative social and cultural impacts [19]. Although the owners or managers of tourism enterprises may not be aware of the theoretical knowledge of sustainability, this does not mean that they do not have a grasp of the concept of sustainability [20]. Woodland’s (2007) [21] study of tourism enterprises in the South Downs conservation area in England found that the majority of businesses recognized the importance of a good natural environment to their operations: 65.9% of them identified the destruction and loss of natural beauty as the greatest threat to the future development of their business. Despite being aware of the importance of the natural environment, tourism enterprises are not aware of the importance of environmental practices in their daily operations, and their environmental performance is not promising [22]. Wang et al. (2012) [23] researched 231 tourism enterprises in Zhangjiajie, which is one of the most famous World Heritage Sites in China, and found that those enterprises performed really poor in knowledge of environmental protection, communication of environmental management and water-saving management. Tourism enterprises are generally managed by owners and have the advantage of being able to respond quickly to sustainability issues as well as the disadvantage of lacking information on market needs and opportunities for change [24]. In this sense, the involvement of tourism enterprises in ecological value co-creation is both a positive and a hindrance. If many tourism enterprises in protected areas are obsessed with maximizing economic benefits and ignore the social as well as ecological value of protected areas, they will destroy the environment and overspend on resources, which may cause irreversible damage to the ecological environment.

Therefore, we say that the function of tourism enterprises in the development of ecological tourism in protected areas is a “double-edged sword”. On the one hand, the development of tourism brings lots of changes to local livelihoods include economic development, infrastructure construction, education and so on [25]. On the other hand,
without effective guidance and restraint, tourism enterprises may bring about phenomena such as uneven quality of products and services, chaotic market order, increased vicious competition, and damage to the ecological value of protected areas. In the reality of ecological tourism practice, the stakeholders involved in ecological tourism activities have significantly different motivations and objectives, play different roles as well as adopt different positions. Even when confronted with sustainability issues, different stakeholders may interpret them differently to advance their own goals [26]. Due to the profit-driven nature of the allocation of limited resources, there is a certain amount of conflict and contradiction between the various goals of different stakeholders, requiring coordination and trade-offs, but also interdependence and the need for cooperation as well as co-creation between them.

The intricate relationship between stakeholders is mainly reflected in the balance between the goals of environmental protection and economic profitability. For example, tourism enterprises are faced with the conflict and choice between maximizing economic profit and fulfilling environmental as well as social responsibilities [27–29]. Protected areas are faced with the conflict between exploiting natural resources for economic profit and limiting the exploitation of natural resources and the environment [30–32]. Tourism enterprises can contribute more to local socioeconomic development if they share a common understanding and voice with other stakeholders about the role tourism plays in the local ecosystem.

Tourism enterprises interact with stakeholders including the protected areas themselves, government, local communities, tourists and others as well as influence the ecosystem, ultimately affecting the overall ecological value of the protected areas. The English word for symbiosis is derived from the Greek words συµβιοσις, βιοσις, σύν and several others, which were originally used to describe people living together, in the same community, etc. Symbiosis is explained in “The Concise Encyclopedia” as any form of common life between two living individuals. The first person recognized by the biological community to have developed the concept of a broad symbiosis was De Bary. De Bary (1897) [33] was the first to introduce the concept of symbiosis in a broad sense, explaining it in general terms as “symbiosis is the close living together of different organisms”, i.e., organisms of different species living together. In the 20th century, biologists have further refined the concept of symbiosis, with Scott (1969) [34] stating that symbiosis is a state of equilibrium in which two or more organisms reach a level of physiological interdependence. Margulis (1991) [35] considered symbiosis to be an important component of the life cycle of members of different species. The most widely accepted concept for generating symbiosis is that proposed by Chertow (2000) [36,37], the key to which is cooperation and the synergistic possibilities offered by geographical proximity.

Symbiosis theory suggests that symmetric mutualistic symbiosis is the most efficient and stable of all symbiosis behavior patterns and that the benefits between symbiosis units are multi-win [38]. The idea of symbiosis was introduced to different disciplines in the mid-20th century; Gross (1956) [39] used symbiosis theory to research small group cohesiveness in one of the most representative papers in the early days, using the theory in social science. Nowadays, sociologists use this theory to (1) describe the relationship between different units [40,41] and (2) analyze the impacts of the symbiosis system (mainly focus on industrial symbiosis) [42,43]. In this paper, protected areas are the suppliers of ecological resources, while the related symbiosis units include the protected areas themselves, the government, tourism enterprises, local communities, tourists and other stakeholders, which have ecological value, and consumers. The interdependence that exists between suppliers and consumers is the source of value creation and realization [44]. The high dependency of stakeholders on resources and between stakeholders makes the value co-creation mechanism the optimal way to build an effective market for ecological value in protected areas.

The realization of ecological service value is not just a one-way transfer from producer to consumer along the value chain, nor is ecological service value co-creation limited to bringing in consumer power at the end of the value chain, but all stakeholders along the entire value chain should be integrated [45]. This is in line with the systemic co-creation
value perspective. Although scholars have put forward the idea of systemic value co-creation, existing research is still limited to the study of value co-creation at the interface between the firm and the customer. There is little research on value co-creation involving multiple actors, and there is a lack of empirical studies. Value co-creation research has been widely favored in the field of goods consumption and services, but its application areas are still very limited [46,47]. In the field of ecomanagement, there is still a gap in the field. In terms of research on value co-creation, most studies only stay at the stage of exploring conceptual models, most empirical studies are case studies, and there is a lack of rich questionnaire-based empirical studies [48]. In addition, there are relatively few studies on the value co-creation scale, and most of them cannot reflect the multi-level connotation of value co-creation. In addition, there are relatively few studies on the value co-creation scale, and most of them do not reflect the multi-layered connotations of value co-creation. Ecological value co-creation is a dynamic process, which requires a healthy interaction between the actors involved. Previous research needs to dig deeper both in terms of defining the concept and measuring it.

Based on this, the following research questions are posed in this study.

What is the definition of the act of ecological value co-creation for tourism enterprises located in protected areas?

What are the characteristics of the ecological value co-creation behavior of tourism enterprises located in protected areas?

How is the ecological value co-creation behavior of tourism enterprises located in protected areas measured?

2. Literature Review
2.1. Value Co-Creation Theory

In the beginning, value was created by producers alone and consumers passively received value [49], whereas in the service dominant logic, producers and consumers co-creating value dominated the view that the value creation process was no longer considered to be fully controlled by producers. It requires interaction and collaboration with consumers, where producers and consumers create and share value together, thus maximizing the benefits for both parties [50]. This is the co-creation of use value that consumers realize in the process of consumption. Another branch of value co-creation theory considers value co-creation to be the co-creation of experiential value, arguing that interactions between value network members are a fundamental and important way of realizing value co-creation, and that co-creation value is formed by heterogeneous interactions between consumers as well as firms at each node of the value network [51,52].

Customer engagement in value co-creation is the focus of scholars. Ranjan (2016) [53] used two dimensions of co-production and use value to measure value co-creation, which included six sub-dimensions of knowledge, fairness, interaction, experience, personalization, and relationship. Yi and Gong (2013) [54] divided the customer value co-creation behavior scale into two dimensions, customer engagement behavior and customer citizenship behavior, through in-role and extra-role behaviors, which encompassed eight dimensions: information seeking, information sharing, responsible behavior, personal interaction, feedback behavior, call-to-action behavior, helping behavior, and forgiving behavior.

Value co-creation research with the firm as the entry point focuses on both firm–customer value co-creation as well as firm-to-firm value co-creation and firm-to-system value co-creation [55,56]. Traditional process design focuses solely on satisfying customer needs and streamlining processes while ignoring the needs of other stakeholders besides the business and the customer [57]. The needs of stakeholders other than the enterprise and the customer are ignored. Value co-creation needs to meet the needs of all stakeholders, focusing on their experiences and interactions with each other. When enterprises give more attention and voice to other stakeholders, they also bring more insights and benefits to the enterprise [58]. As value co-creation theory deepened further, later studies suggested that value co-creation should not only focus on the relationship between producers and
consumers but should integrate more subjects and sources involved in value creation, where value is created by the whole system [59]. As no single subject can fully possess or gain access to all needed resources, value is co-created within the service ecosystem, which represents a dynamic and interconnected network of resource integrating subjects connected by a shared institutional logic and mutual value creation. The effective realization of value co-creation requires mechanisms for resource integration and interaction, and the key to determining the mechanisms lies in the selection of the core subjects in the co-creation process, with the core co-creation subjects setting the rules for involving and interacting with other co-creation subjects [60].

Participants integrate resources in their practice, and greater resource density corresponds to participant-specific goals that correspond to greater value. Participant subjects support the role of other participants in the value creation process by providing resources appropriate to the practice. Cui et al. (2017) [61] used the qualitative research method of rooting theory to construct a theoretical model of value co-creation among the core subjects of exhibitions (organizer, exhibitor and professional audience), and they proposed that the value co-creation between the core subjects is fair through the acts of functional interaction, content interaction, service interaction, channel interaction and emotional interaction. Zhi et al. (2014) [62] stated that in the supply chain, the main mechanism of value co-creation is one of interaction and the other is of integration. Through the interaction and communication among the nodes of the supply chain, the use of information, knowledge and operational resources can be achieved. Through the integration of relationships, resources and networks, good cooperation can be established to enhance the competitiveness of the enterprise itself and promote the overall stakeholder satisfaction.

2.2. Symbiosis Theory

Like the natural environment, human societies also have a clear symbiosis in their economy, culture, social relations and behavior. This symbiosis is more clearly characterized by initiative and consciousness [63,64]. In the 1970s, the idea of biological symbiosis was introduced into the study of business management, which subsequently gave rise to the theory of industrial symbiosis in the field of management. In the theory of industrial symbiosis, different enterprises share and exchange materials and energy as well as water resources in order to save costs and increase efficiency [65,66].

The concept of symbiosis was first introduced in tourism studies as early as 1976 by Gerardo and Budowski (1976) [67], who first proposed that tourism development and ecological conservation should be symbiotic rather than conflict. On this point, scholars have gone increasingly deeper in later studies. For example, Yang et al. (2018) [68] evaluated the symbiosis status of tourism towns based on the Lotka–Volterra model. The paper analyzed 18 tourism towns in China and put them into three quadrants and with different RHS (Relationship of Harmonious Symbiosis) values. Richard et al. (2019) [69] used endosymbiosis theory to interpret the inter-dependencies of youth employment and tourism organizations and found that the relationship between young workers and tourism organizations is dynamic and processual, which is consistent with the evolutionary nature of endosymbiosis as relating to two organisms. Symbiosis is used in the field of tourism and is reflected in resource symbiosis, management symbiosis, industrial symbiosis as well as environmental symbiosis, where resource symbiosis is the basis and prerequisite and industrial symbiosis is the core. Especially in the ecological tourism of protected areas, the foundation and prerequisite of resource symbiosis is fully reflected.

Colloquially, symbiosis (the concept of biology) means living together. In the context of protected areas, this relationship can also be seen as a “participatory” one in which humans are in symbiosis with other species on the planet, thus achieving an equitable status. Humans serve by constructing cooperative and complementary relationships through which all other species are better off [70]. The symbiosis relationship between humans and nature allows for an essentially intertwined socioeconomic dynamism and long-term sustainability of the environmental resource base [71]. Under the symbiosis interface of
protected areas, government departments attract private capital to engage in protected areas tourism development through investment promotion and enterprises use, and they rely on the natural resources of protected areas for development as well as operation, and the resulting tax revenue compensates to some extent for the predicament of insufficient funds for protected areas. For tourists, the environmental suitability, economic viability, socio-cultural acceptability and sustainability of the tourism experience are prerequisites for the existence of all forms of tourism. If there is no experience, tourists will stop coming, it will not be economically viable, and services and facilities will not be guaranteed. There will be no economic benefits for tourism enterprises and communities. If it is culturally unacceptable, local communities will be hostile or even resistant to tourists, and communities will not develop positive environmental behavioral intentions if they have not developed good cognitive social capital. If the protected area environment is destroyed, then all the foundations for survival and development will not exist [72]. Thus, protected areas have interdependent and interrelated relationships between stakeholders and between stakeholders as well as the ecological environment in which material, information and energy are exchanged. The state of mutuality is a symbiosis.

Sanette (2011) [73] discussed the symbiosis situation between people and protected areas in three scenarios. The first scenario is mutualistic symbiosis, where both the protected areas and the people involved benefit from the relationship, both in terms of creating a first-class tourist destination through the development of the protected areas, thereby reaping economic gains and eradicating extreme poverty, as well as in terms of maintaining environmental sustainability. The second scenario is commensalism, where the human side gains and the ecological integrality of protected areas is maintained, even though there is no direct benefit. The third scenario is parasitism, where the human side gains but the protected areas suffer. The relationship between tourism and conservation has been in focus since the 1970s, which is now changing from a conflict-based environment to one based on symbiosis. The ecological tourists of protected areas, tourism enterprises, local communities, local governments, NGOs, etc. should become effective guardians and enhancers of protected areas in order to fit in with the principles of ecological tourism and thus achieve symbiosis between tourism and conservation [74].

2.3. Ecological Value Co-Creation

Lu (2013) suggested that from an ecological perspective, ecological value is the value of the existence of ecosystems and the value of ecosystem services. The “natural value” of ecosystem existence is reflected in the unity of the “world as a whole”, which is expressed in three aspects: the value of creation, the value of balance, and the value of self-cleaning. Some argued that ecological goods and ecosystem services are synonymous [75]. So, ecological value is both the value of ecological goods and the value of ecosystem services, which is multi-dimensional, containing both use and non-use values as well as both economic value and non-economic value. Use value is reflected in the provision of food, water, timber and fiber by ecosystems. Non-use value is the existence of a definite value for a resource even if it will never be used by humans. Many cultural, ethical, religious and other perspectives argued that ecosystems have value even if they do not contribute directly to human well-being [76]. Economic value is reflected in the transformation of ecological products into educational and tourism products, which bring economic benefits. Non-economic value, also known as non-utility value, is a reflection of the social value of ecosystems such as the provision of cultural services for recreation, aesthetic enjoyment and spiritual benefits. Ecological value has both explicit and implicit definitions [77]. The explicit definition emphasizes the long-term sustainability of the structure and functioning of ecosystems, which is used as a general guide for strategic decisions on environmental policy and management. Implicit definitions emphasize both the important value of ecosystems for maintaining biodiversity and focus on the value of ecosystems for providing goods as well as services to humans, which encompasses both economic goods (e.g., crops) and non-economic goods (e.g., human health). This study uses an implicit definition of
ecological value as an overarching value that encompasses environmental value, economic value and social value.

Although ecological value belongs to a popular area of research, there is still a lack of relevant studies on the process of realizing ecological value and the stakeholders involved [78]. Domestic research on ecological value has focused on qualitative analysis of concepts, characteristics and quantitative assessment of ecological value [79,80]. Research methods include market value approach, opportunity cost approach and shadow engineering approach. Most of the research perspectives are confined to the natural sciences. The results are static evaluation values. However, the realization of ecological value and the process of value preservation and appreciation is a dynamic process, which is influenced by the behavior of the participants, and previous studies are obviously insufficient.

As the most effective means of conserving biodiversity and its biological and ecological processes [81], the establishment of protected areas has become a central part of almost all national and international biodiversity conservation strategies. Protected areas are also defined by the World Conservation Union (IUCN) as “lands or seas where laws and other effective means are used to protect and conserve biodiversity, natural and cultural resources”. By definition, protected areas limit the human use of resources and may result in a corresponding reduction in local income. However, protected areas may also generate new income from ecological tourism, stimulate the upgrading of local infrastructure, or increase economically beneficial environmental services [82]. Protected areas are important as a form of natural resource conservation and as a place to provide nature recreation as well as science education for people. Tourism is the expression of the existence and use value of protected areas; its ecological value should be valued. However, excessive tourism development can cause environmental damage and even overdraw intergenerational consumption [83]. The interests of the protected areas all want to be at the negotiating table for tourism planning, including tour operators, the accommodation industry, the catering industry, and protected area management agencies. Ecological tourism in protected areas requires infrastructure development, including housing, trails, bridges, signs, roads, parking, trams, visitor or learning centers, administrative facilities, etc., which may negatively impact on locally retained ecological and cultural values [84]. Multiple stakeholders have different perspectives on development and varying degrees of influence on decision making. No single independent stakeholder has complete control over the plan. The interests and activities of the public and private sectors conflict with each other, with consequent impacts on economic, ecological and social well-being [85]. Therefore, in order to balance development and conservation, care should be taken in planning that environmental value is not used too quickly; otherwise, it will be difficult to achieve the sustainable development of ecological tourism [86]. For ecosystems in protected areas, the concept of ecological value can be an important guide when thinking about the trade-offs and interactions between society and nature to achieve a sustainable increase in human well-being [87].

Silvestre and Dyck (2017) [88] divided sustainable innovation into two types: those that firms do based on the economic returns they can generate and those that are driven by social as well as ecological returns, with the second prioritizing socio-ecological value creation over economic value capture. They perform better in terms of socio-ecological value creation if they collaborate, share and learn from others [89,90]. Of course, this value creation also brings economic rewards, and value creation is shared by all stakeholders. Value co-creation theory has moved from an emphasis on firms and consumers to an emphasis on value-based interactions between core subjects, providing a new pathway for revisiting the preservation of ecological value in protected areas.

Therefore, this study proposes the concept of ecological value co-creation in protected areas and defines it as “the interaction, integration and cooperation between stakeholders of protected areas based on their dependence on ecological resources, the construction and observance of the order as well as rules of development, in order to achieve a balance between ecological resources protection and development, as well as to jointly create the maximum environmental value, social value and economic value”. The concept of
ecological value co-creation is very ambitious, encompassing attitudes, concepts, behaviors and outcomes. This study focuses on the exploration and identification of ecological value co-creation behavior as well as takes tourism enterprises as one of its core subjects as an entry point to explore the patterns and characteristics of ecological value co-creation behavior in tourism enterprises in order to lay the foundation for future empirical studies on ecological value co-creation.

3. Materials and Method

3.1. Method

Scale development traditionally follows the eight steps proposed by Churchill (1979) [91] while Morgado et al. (2017) [92] reviewed scale development papers in major databases and pointed out that the current practice of scale development process includes 3 steps, which are item generation, theoretical analysis and psychometric analysis. In this study, we referred to Churchill’s scale development steps and also follow the mainstream of nowadays’ scale development process to develop and validate the ecological value co-creation behavioral scale.

3.2. Item Generation

In developing the initial measures of ecological value co-creation behavior, the methodology used in this study was based on a literature review and an in-depth interview to develop measures that complemented each other. The protected areas of Dinghu mountain and Danxia mountain in Guangdong province in southern China were selected as case sites (see Figure 1). Guangdong province is the most economically developed province in China and also has one of the highest forest coverage rates, reaching 58% in 2021. At the same time, as of 2021, there are 1362 protected areas including nature reserves, national parks, geoparks, forest parks and wetland parks in Guangdong province [93]. Dinghu mountain is located in the city of Zhaoqing in the west-central part of Guangdong province, at 23°10′ N and 112°31′ E. It has a total area of 11.33 square kilometers, which was the first nature reserve in China in 1956. With a history of 66 years, it has received over 4.4 million visitors for the year 2019 as a 5A national scenic spot [94]. Danxia mountain is located within Shaoguan city in northern Guangdong province, with geographical coordinates between 113°36′ E and 24°51′ N and a total area of 292 km. Danxia mountain is a 5A tourist attraction that has been open to the public since 1980, which is also one of the world’s first world geopark and World Natural Heritage site, receiving 2.85 million visitors in 2019 [95]. These two nature reserves in Guangdong province were chosen as case study sites for several reasons. Firstly, the Dinghu mountain nature reserve in western Guangdong province was the first nature reserve established in China in 1956, which has rich experience in nature conservation and tourism development. Secondly, as a national nature reserve, Danxia mountain was approved by UNESCO as one of the world’s first geoparks on 13 February 2004 and was included in “The World Heritage List” in 2010. As the “Danxia landform” naming site, Danxia mountain has considerable influence in the world. Finally, both case sites are protected areas in Guangdong province where private capital was introduced early for tourism development, their tourism enterprises are relatively rich and typical, with enterprises of state-owned, foreign-funded, private and individual household enterprises.
The in-depth interview was conducted in January–February 2021. After developing the interview outline, the interviewers went to two protected areas in Guangdong province to conduct interviews with relevant stakeholders, including the management committee of the protected areas, tourism enterprises and other senior management. Questions were sent to the interviewees in advance so that they could have a better understanding of the questions. The total interview time was nearly 11 h and the transcripts were transcribed to a total of over 60,000 words. In order to organize the interview transcripts more effectively, each interviewee and the interviewed organization were numbered in this paper, with category A being organizations and enterprises in case location 1 and category B being organizations as well as enterprises in case location 2. The basic profile of the interviewees and their coding are shown in Table 1.

Table 1. Interviewees’ profile.

| No. | Interviewees  | Affiliated Enterprises                      | Nature of Enterprises          | Position of the Interviewees |
|-----|---------------|---------------------------------------------|--------------------------------|------------------------------|
| A1  | Mr. Zhong     | Dinghu Mountain Management Committee        | Management committee          | Director                     |
| A2  | Mr. Tang      | Yuntianhai Forest Resort                    | State-owned enterprise        | Deputy General Manager       |
| A3  | Mr. Wen       | Dinghu Mountain Resort                      | Private enterprise            | General Manager              |
| A4  | Mr. Lee       | Yuandian Art Guest House                    | Private enterprise            | Owner                        |
| A5  | Mr. Guo       | Fenyangju Hotel                             | Private enterprise            | Owner                        |
| A6  | Mr. Gan       | Zhuzhuang Hotel                            | Private enterprise            | Director                     |
| A7  | Mr. Long      | Fulaige Hotel                              | Private enterprise            | Director                     |
| B1  | Ms. Chen      | Danxia Mountain Management Committee        | Management committee          | Deputy Director              |
| B2  | Mr. Yu        | Danxia Mountain Nature School               | Non-profit organization       | Director                     |
| B3  | Mr. Zhang     | Danxia Mountain Cable-car company           | Joint venture enterprise      | General Manager              |
| B4  | Mr. Jiang     | Danxia Curise Line company                  | Private enterprise            | Deputy General Manager       |
| B5  | Ms. Liu       | Yuanse Guest House                         | Private enterprise            | General Manager              |
| B6  | Mr. Mei       | Yanzi Nian B&B                             | Individual household          | Director                     |
| B7  | Mr. Mu        | Danxia Mountain International Youth Hostel  | Individual household          | Owner                        |
This study adopted the steps of qualitative data analysis proposed by Caulley (2007) [96]. A coding manual was created for the collated interview texts, converting the abstract descriptions of ecological value co-creation behaviors into relevant and concrete descriptions. Then, another researcher with a background in ecological tourism studies was invited to code them separately. After coding analysis, the descriptions that were repeated and had the same meaning were collated. Finally, it was grouped into five main categories and 28 sub-categories. A representative interview statement was extracted for each sub-category (Table 2).

Table 2. Ecological value co-creation behavioral categories and representation interview statements.

| Main Category        | Subcategory                  | Frequency | Representative Interview Statements                                                                                                                                                                                                 |
|---------------------|------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pro-environmental Behavior | Understanding environmental information | 3         | B3 Management committee sends us information on nature conservation or asks us to participate in important activities to raise awareness and consciousness of the conservation of the landscape sometimes.                                          |
|                      | Compliance with environmental regulations | 4         | A2 There is no process and no formalities, to cut trees to build lodging is illegal, it requires applying for filing. After the planning assessment confirms that it does not affect the overall ecological environment, it can be completed. It definitely needs to be assessed by experts and is not that arbitrary. It really is illegal to cut down at will. |
|                      | Energy conservation           | 3         | A2 We will use some low-energy devices, TVs and lights are going according to this requirement. Not cutting down trees at random is also a form of energy saving.                                                                   |
|                      | Use of environmentally friendly materials | 3         | A6 We have a dedicated cutlery cleaning plant here and the cutlery is delivered centrally, we do not use disposable cutlery.                                                                                                     |
|                      | Disposal of waste materials   | 7         | A7 There are strict requirements from the management committee regarding ecological protection. Because Nankun mountain is mainly about ecology, there are strict controls on the discharge of sewage. There is a special drainage ditch for waste water, which will be discharged to a sewage treatment system below, so that the waste water can meet the discharge standard before being discharged. |
|                      | Participation in environmental volunteering activities | 3         | A7 We focus on developing environmental awareness on our side. For example, we go to the top of Nankun mountain to pick up rubbish, or we organize street cleaning when the holidays are approaching.                 |
|                      | Dissemination of environmental information | 1         | A2 In terms of environmental education for staff, systems are used to regulate human behavior. Thoughtful education is present in every training session: the stick and the carrot.                                      |
|                      | Alerting or resisting environmentally damaging behavior | 1         | A7 If I find that a business or a visitor is damaging the environment, I will go and remind them. We will also have many signs in the scenic area to remind visitors to take care of the ecological environment. |
|                      | Paying extra costs to restore the ecosystem | 3         | B4 The burden of expense of replacing all boats that use oil with electric boats is certainly a burden at first. However in the long run, it is all a trend. A small burden is also needed for the time being, in terms of sustainability. The costing we can work out. |
| Dialogue             | Exchange of product and service information | 7         | B2 Our nature school also takes the initiative to reach out to those guest houses in the neighborhood that do excursions. We play openly with them, it is not that I just maintain my part of the customer base, we are open and welcome them to come in together as well. |
|                      | Good and open communication    | 5         | A7 Communication with the management committee is generally smooth and any problems are resolved well, as everyone is local and there is generally no confusing communication.                                                  |
### Table 2. Cont.

| Main Category | Subcategory                                      | Frequency | Representative Interview Statements                                                                                                                                                                                                                                                                                                                                 |
|---------------|--------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Use of dialogue to resolve differences of opinion| 3         | A2 The format of the symposium is an open topic; brainstorming is not minding what you say, take it if it works, filter it if it does not; these are all things that can be brought up to each other, difficulties, complaints, whatever. We will also make suggestions, which are very common. Because we have our own difficulties, but through communication with the management committee, mutual coordination and mutual understanding, we can solve problems.                                                                                           |
|               | Establishment of channels for information sharing| 5         | A6 The management committee has a WeChat platform. There are also two groups we have, one for large enterprises and one for farmhouses. In the WeChat group, there will be the Boxiang Hotel, Shizishui and so on, which are relatively large hotels. There are about 20 enterprises in them, and there will also be village cadres such as the village committee and the secretary, including the Xiaping and Shangping villages.                                                             |
| Knowledge sharing | Exchange and discussion on ecological product services | 6         | A7 We also have some exchanges between local villagers. For example, if a guest wants to eat this dish that we do not have in our house, they will go to the restaurant next door that has this dish and order it.                                                                                                                                                                                                                   |
|               | Access to new knowledge of ecological products services | 4         | B6 We attend sharing sessions organized by the management committee sometimes in that geological museum about science and popularization.                                                                                                                                                                                                                                                                               |
|               | Learning to follow up on innovation in ecological products services | 4         | A6 People in the restaurant business around would imitate us. For example, some of the decorations in our restaurant are made of bamboo. So, when other people saw it, they made it out of bamboo too; others copied our menu. The roast chicken used to be roasted manually, but then I added a motor to roast it electrically, so others copied that, too.                                                                 |
|               | Voluntary sharing of experience and knowledge      | 5         | A3 If the management committee invites our hotel to do some experience-sharing activities, it is not only an exchange process between the enterprises but also a promotion for ourselves; why not?                                                                                                                                                                                                                                  |
|               | Improvement of the competitiveness through the competitors | 9         | A4 Nankun mountain is welcoming to outside businesses and I also hope that there will be more shops like mine in this town so that an industry can be formed, or at least an atmosphere can be created, which will drive the clientele. Every change of hands brings in something new from outside, so it keeps the whole tourist area alive and shining.                                                                                       |
| Co-creation behavior | Mutual referrals                                   | 2         | A2 Resources sharing, for some guests, we cannot meet their requirements, we do not have a spa, but we can recommend them to Shizishui. We recommend each other; they also push to us. We will also have contact with some of the owners of the farmhouse. Some guests said, there is no recommendation of some shops, we will also have a recommendation. These are resources.                                                                                      |
|               | Cooperation in the development of ecological products and services | 3         | B2 Guest House B&B can provide food and accommodation as well as being a guest house in itself; they can easily work it out and can do very well. We will also give them the requirement for a life class course. That is definitely their strong point. But they don’t have the manpower to do this outdoors either, and the course activities would require us to go and execute it for them. They are not professional, either. So I should say it’s each doing their own area, but we just combine to do it together. |
### Table 2. Cont.

| Main Category                                      | Subcategory                                      | Frequency | Representative Interview Statements                                                                                                                                                                                                 |
|---------------------------------------------------|--------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **Enhancing competitiveness through cooperation** |                                                  | 3         | B5 The rural tour is a combination of all the local resources, and we are the ones who work most closely with Danxia mountain, the villages and the cruise enterprises. We have basically formed a system and have been doing these courses and activities for a long time, we are used to doing them. At Danxia mountain, it is just doing what belongs inside Danxia mountain. The villagers outside just do what is outside, its own experimental projects such as digging sweet potatoes, cutting rice and catching chickens. But it also seems that we are the only ones who do a course that blends Danxia mountain with the villagers and art for a few days in a row. |
| **Building a mutually beneficial partnership**     |                                                  | 3         | A2 Since we have this shared resource, we all have different environments, the same competition, but with differences. It’s all neighbourhood enterprises and we need to maintain a good collaborative approach. As long as there are people we have a way to do business. Our main idea is to be unified, we want to attract people from outside. Apart from us doing it, other people do it too, how do you bring others up to compete, share resources, complement each other, improve the package and form a win–win situation. |
| **Collective reputation**                          | **Creation of a regional trademark or brand identity** | 4         | A1 “Nankun mountain” is a trademark that I registered more than ten years ago. At present, the following enterprises in Yong Han Town, such as “Fuli Nankun Mountain” and “Biguiyuan Nankun Mountain Spa” are infringing.                                                                                     |
|                                                   | **Dependence on scenic spots for customer resources** | 2         | A6 Some of our guests come to our house specifically for dinner after being introduced to us by friends, but this is less frequent, or they come to Nankun mountain and then drop by our house for a meal more often.                                      |
| **Reliance on scenic spots for talent**            |                                                  | 2         | B1 It is a little bit more remote in the mountains, but because there are so many interesting inns, so many young people, all kinds of new forces coming in. They don’t feel like a closed place, either. It feels like an open mountain, it’s not the kind of place you see in other reserves, it’s not the kind of place that’s cold and quiet, it’s very vibrant. |
| **Binding ecological damage, bad product service practices** |                                              | 1         | A7 If there are enterprises in the scenic area with shoddy products or bad service practices, it will have an impact on the whole area. There will be strict controls on the management committee side.                                                                                           |
| **Help of scenic areas to build and maintain a good image as a tourist destination** |                                              | 2         | A2 We are all about serving our guests, the whole Nankun mountain is a brand. If the guests see that the village is dirty and the villagers are brutal, there will be no more guests in the future. We are being a model, an example, regulating our own behavior first, ourselves before others. We have to set a good example for ourselves so that they can learn and see that this is how big enterprises do things, this is how they have rules and regulations. We have to set an example to them, and that’s all we can do. |
| **Leading the way in scenic awareness**            |                                                  | 2         | A2 According to my point of view, it turns out that this is a mountain and a village. If there is no big enterprise to drive it, it will not work any more. After all, small enterprises are small-scale. The premise is definitely to have a big enterprise to drive the economy, the flow of people and visitors. |

### 3.3. Theoretical Analysis

(1) **Pro-environmental behavior**

Due to the dependence of tourism enterprises’ development on natural resources, enterprises are driven by the needs of the symbiosis unit to consciously or unconsciously adopt environmental protection behavior in order to achieve the goal of sustainable development of the enterprise, which is the most important characteristic of ecological value.
co-creation that distinguishes it from general value co-creation. There is a positive interaction between tourism enterprises and the natural environment, i.e., pro-environmental behavior, which is an important form of ecological value co-creation behavior.

Smith and Ayres (1995) [97] classified environmentally responsible behaviors into civic action, educational action, financial action, legal action, physical action and persuasive action. Stern et al. (1999) [98] classified pro-environmental behavior as follows: environmental activism behavior (e.g., participation in environmental protection-related marches), environmental citizenship behavior (e.g., donations to environmental protection charities), environmental policy support behavior (e.g., willingness to sacrifice personal comfort for a good environment) and private sector behavior (e.g., low-carbon everyday behavior). Cheng et al. (2013) [99] refined the study through two dimensions, general pro-environmental behavior and specific pro-environmental behavior, and they proposed eight question items. Ramkissoon et al. (2013) [100] refined the study by low involvement behavior and high involvement behavior, proposing nine question items to measure pro-environmental behavior. Wu (2017) used Hughes et al. (2011) [101,102] and their pro-environmental behavior scale was adapted and modified to our context, and nine questions were proposed. The above literature provides an important reference for the development of the core variable “pro-environmental behavior” for the ecological value co-creation behavior of small tourism enterprises in protected areas. The overall summary is presented in Table 3.

Table 3. Literature references for scale development of “pro-environmental behavior”.

| Core Concepts/Variables | Scale | Object | Author |
|-------------------------|-------|--------|--------|
| Environmental responsibility behavior | General conduct:  
- To solve the environmental problems.  
- To read reports or books related to the environment.  
- To discuss with others issues related to the environmental protection.  
- To convince my companions to protect the natural environment.  
Specific acts:  
- To report environment damage behaviors to authorities.  
- Observance of laws about environmental protection.  
- To pick litter on the beach.  
- To attend clean-up on the beach. | Visitors to the Penghu Islands | Cheng et al. (2013) [99] |
| Pro-environmental behavior | Low involvement:  
- To reduce my visits to the national park if one of my favorite attractions needed to be restored.  
- To stop visiting the national park if one of my favorite attractions needed to be restored.  
- To tell my friends not to feed the animals in the national park.  
- To sign the petition to protect this national park.  
- Learned about the natural environment of the national park.  
- To pay the extra entry fee for the national park project.  
High involvement:  
- To invest time in national park protection projects.  
- To attend national park public meetings.  
- To write in support of this national park. | Visitors in the national park | Ramkissoon et al. (2013) [100] |
Table 3. Cont.

| Core Concepts/Variables | Scale | Object | Author |
|-------------------------|-------|--------|--------|
| Pro-environmental behavior | -To use energy sparingly.  
-To recycle household waste.  
-To sort the garbage.  
-To use recycle bags for shopping.  
-To use public transport.  
-To remind people to protect environment.  
-To learn about environmental issues.  
-To make donations to support environmental projects.  
-To participate in voluntary activities in environmental protection. | The individual in a life situation | Wu (2017) [102] |

(2) Dialogue

Prahalad and Ramaswamy (2004) proposed the DART model of value co-creation which form the cornerstones of value co-creation. DART refers to Dialogue, Access, Risk-benefits, and Transparency. They pointed out that the dialogue implies that each subject has the awareness and idea of investing resources or energy in the other, and has the propensity to take action. In a unidimensional approach to measuring value co-creation activities, customer involvement and interaction are important elements of value co-creation [103]. In a multi-dimensional and multi-level measurement of value co-creation behavior, information seeking and information sharing in customer engagement behavior is an important dimension of value co-creation behavior. The expression and exchange of information between consumers and enterprises is an important dimension of value co-creation behavior. Regarding how to engage in value co-creation with other stakeholders in the system, Ramaswamy and Gouillart (2010) suggested that the steps to achieve the value co-creation model include: identifying the stakeholders of the system; analyzing the interactions between the stakeholders; facilitating the stakeholders to share experiences; and constructing stakeholder building a platform for new interactions for ongoing dialogue. One of the important principles is interaction and sharing.

Xie (2013) and Ren et al., (2014) [104,105] developed and validated an inter-firm value co-creation scale based on the value co-creation DART model. Their research collectively concluded that “dialogue” as one of the dimensions of value co-creation can be measured by four question items. Ranjan and Read (2016) [53], based on the theory of value co-creation based on service-dominant logic, suggested that consumer–firm interaction is one of the important dimensions to achieve co-creation of value in use, which can be measured by four question items. The overall summary is presented in Table 4.

Table 4. Scale development reference collation for “dialogue”.

| Core Concepts/Variables | Scale | Object | Author |
|-------------------------|-------|--------|--------|
| Dialogue | -To exchange information with the downstream enterprise.  
-To communicate with the downstream enterprise as much as possible.  
-Communication with the downstream enterprise is open and good.  
-To use dialogue to resolve any disagreements with the downstream enterprise. | Upstream enterprises in value co-creation with downstream enterprises | Xie (2013), Ren et al. (2014) [104,105] |
| Interaction | -To easily express my specific requirements throughout the process.  
-Enterprises communicate process-related information to consumers.  
-To provide adequate customer interactions.  
-To take an active role in the interaction. | Consumers who engage in value co-creation with enterprises | Ranjan and Read (2016) [53] |
(3) Knowledge sharing

Knowledge sharing has been an indispensable dimension of value co-creation. Ranjan and Read’s (2016) analysis of 149 studies conducted after 2000 found that 19% of the studies included “knowledge sharing” as a dimension of value co-creation. Knowledge sharing is a fundamental operational resource that encompasses the combination and expression of knowledge, ideas and innovations for current as well as future needs [106,107]. Information sharing between firms and consumers about past experiences, ideas and suggestions, innovations, realities, as well as roles can enhance the competitiveness of value co-creation [108]. From another point of view, knowledge sharing is also one of the forms of interaction, a deeper level of interaction. It means the exchange and discussion of professional issues between core subjects, the sharing of experiences and knowledge, as well as learning from each other, leading to the sharing of knowledge. In terms of how value co-creation can take place with other stakeholders in the system, Ramaswamy and Gouillart (2010) suggested that the steps to achieve the value co-creation model include “facilitating experience sharing among stakeholders”. One of the key principles is that “a platform should be constructed for all stakeholders to interact and share their experiences”. The overall summary is presented in Table 5.

Table 5. Scale development reference collation for “knowledge sharing”.

| Core Concepts/Variables | Scale | Object | Author |
|-------------------------|-------|--------|--------|
| Collective learning and knowledge sharing network | -To transfer knowledge between enterprises in your industry on a regular basis.  
-Technical and managerial staff often interact with other enterprises in a personal way.  
-To imitate or follow the product and process innovations made by other enterprises in the same industry.  
-To capture the benefits of technological innovation spillovers from other enterprises in the same industry.  
-To acquire new production and management knowledge from other enterprises or organizations. | Manufacturing cluster enterprises | Geng, 2005 [109] |
| Knowledge sharing | -Welcoming my comments and suggestions on existing products as well as the development of new products.  
-Providing me with full explanations and information.  
-To give my time to comment on their products and work flow.  
-To provide the right environment and opportunity for me to make comments and suggestions. | Consumers who engage in value co-creation with enterprises | Ranjan and Read (2016) [53] |

(4) Co-opetition behavior

In the field of strategy and management research, the concept of “co-opetition” first emerged in the 1980s. Noorda, the founder and CEO of Novell, suggested that firms could compete and cooperate with each other at the same time [110]. Brandenburger and Nalebuff (1996) [111] further defined the relationship between firms that are both competitive and cooperative as “competition” and coined the term co-opetition. Gnyawali and Park (2011) [112] suggested that co-opetition is to take the bilateral relationship between two firms as the unit of analysis and consider that competition is a one-to-one, direct, simultaneous cooperative and competitive relationship that exists between two firms as well as a strategy that pursues both cooperation and competition between firms. Other scholars believed the co-opetition is considered to be a collection of relationships in which both competition and cooperation are embedded in the network, which exhibit the interaction of competition and cooperation across bilateral relationships [113,114]. The inter-firm relationship from the co-opetition perspective should emphasize both competition and cooperation, which is the only way to truly capture the essence of the interdependence that exists between the firms that cooperate with each other [115].
The co-opetition relationship is a dynamic process in which competition and cooperation exist simultaneously in the creation and distribution of value but only in the competition stage, where cooperation is dominant, as well as in the distribution stage, where competition is dominant. Co-opetition can be a one-to-one relationship, or it can include multiple participants, including co-creation between direct competitors, as well as different forms of co-opetition between strategic alliance enterprises and supply chain members. The above three connotations provide an important reference for co-opetition behavior as an important component of value co-creation in a system.

Li (2012) [116] considered the above four relationships and proposed that co-opetition behavior could be measured by 22 questions. Geng (2005) proposed that co-creation interaction could be measured by five questions based on the research of Hoopes et al. (1999), Maskell et al. (1999), and Spender et al. (1998) [106,107,117]. The overall summary is presented in Table 6.

Table 6. Scale development reference collation for “co-opetition behavior”.

| Core Concepts /Variables | Scale | Object | Author |
|--------------------------|-------|--------|--------|
| Co-opetition behavior    |       |        |        |
| With suppliers:          | -To improve its responsiveness to the market. | | |
| -Stable cooperation will help the enterprise to build a good image in the market. | | | |
| -Regular exchanges of information with the supplier. | | | |
| -To own a decisive say in the quality of the supplier’s products. | | | |
| -Mutually beneficial relationship between enterprise and suppliers. | | | |
| -To have multiple suppliers competing against each other. | | | |
| -Regular communication between the senior management of the enterprise and the supplier. | | | |
| With the buyer’s enterprises: | -The customer always provides good advice to the enterprise. | Cluster enterprises in high-tech parks | Li (2012) [116] |
| -To be sensitive to changes in market demand from the customers. | | | |
| -To cooperate with the customer in the production, research and development, human resources, etc. | | | |
| -Exchanges of information between the enterprise and the customers in terms of knowledge and skills. | | | |
| -Relative to enterprise, the customers are in a strong negotiating position. | | | |
| -The customer always demands a higher quality product or service. | | | |
| With the same industry: | -The enterprise is our main competitor. | | |
| -Competing with this enterprise can significantly improve our operational efficiency. | | | |
| -To learn knowledge and skills from the business. | | | |
| With complementary producers: | -Has formed a good communication and cooperation relationship with our enterprise. | Manufacturing enterprises | Hoopes et al. 1999, Maskell et al. 1999, and Spender et al. 1998[106,107,117] |
| -To help to enhance the market image of our products. | | | |
| -To help to improve the overall quality of our products with our customers. | | | |
| -The development of the market requires a joint effort from both of us. | | | |
| Co-opetition interaction | -Has developed a strong desire to collaborate with competitors. | | |
| -Would be better served by working with related enterprises with which you have a competitive relationship. | | | |
| -Always gains more from working with competitors. | | | |
| -Competitor’s advertising campaign will also help to increase sales of your products. | | | |
(5) Construction of destination reputation

For protected areas, the reputation of the destination is particularly important for the development of tourism enterprises. Most tourists do not come for a particular tourism enterprise but rather for the good ecological environment and tourism products and services of protected areas. A reputable destination is more credible and reliable than a less reputable one [118], which positively affects the destination image [119], perceived value and visitor loyalty, ultimately affecting visitor satisfaction [120]. Destination reputation has not been studied much in tourism studies; the image of a destination has been studied more, but the two constructs are similar in meaning yet distinct. In contrast to image, reputation is more enduring and subjective [121], relatively consistent and stable. It cannot be built quickly and easily but needs to be built through organizational behavior, action and communication over time. Christou (2003) [122] suggested that destination reputation is a combination of opinions, perceptions, knowledge and attitudes of different stakeholders as a whole toward a tourist destination. Drawing on the concept of organizational and corporate reputation, destination reputation can be defined as the overall perceived evaluation of a destination by tourists based on the evaluation of its actions, performance, etc. over time [123].

In nature reserves, the overall ecological environment, tourism image, environmental ambience, reputation and popularity of the entire tourist site are fundamental to the survival and development of the enterprise. The construction of a good destination reputation is an important expression of the in-depth interaction between tourism enterprises as well as between tourism enterprises and management bodies, which is an important requirement for ecological value co-creation.

When considering the topic items of the destination reputation construct, one can draw on the measurement of collective reputation in the sharedness resources of cluster firms. Based on the studies of Hall (1992), Roberts et al. (2002) and Ferguson et al. (2000), reputation can be measured by four question items [124–126]. Du et al. (2015) [127] proposed that the dimension of collective reputation can be measured by four question items in the shared resources of logistics clusters. The overall summary is presented in Table 7.

| Core Concepts/Variables | Scale | Object | Author |
|-------------------------|-------|--------|--------|
| Collective reputation   | - Be able to guess what industry you are in by saying where you are located.   |
|                         | - Regional trademark or brand identity is unique. |
|                         | - Region’s overall perception by the outside world will be of great help to the enterprise in gaining access to customers.   |
|                         | - Any of the region’s businesses are to commit forgery, the reputation of the whole region would be seriously affected. |
|                         | Manufacturing cluster enterprises | Hall (1992), Roberts et al. (2002) and Ferguson et al. (2000) [124–126] |
| Shared reputation       | - External perception can help enterprises gain access to customer resources. |
|                         | - The reputation of the whole park will be seriously affected if any enterprise here causes troubles. |
|                         | - Overall image helps enterprises to acquire professional talents.   |
|                         | - The overall product information helps enterprises to sell the product. |
|                         | Logistics cluster enterprises | Du et al. (2015) [127] |

Drawing on the application of value co-creation theory in the context of protected areas, the original title was developed in conjunction with an in-depth review of the categories. Five scholars in the field of ecological tourism were invited to review the basic content and presentation of the original title items one by one to determine whether they were appropriate and to propose corresponding changes. In addition, 25 tourism enterprises that rely on protected areas for tourism business operation and development were tested at the ITE HCMC in Guangzhou from 1 to 3 March 2022 to examine whether the wording
of the question items was easy to understand and the reasonableness of the question item setting. Based on their comments, adjustments were made to the questions that did not accurately convey a clear meaning, were poorly worded, or were misleading or confusing. The amendments mainly include the following:

1. The overgeneralized and difficult topics are deleted, such as “the sustainable use of natural ecological resources by enterprises” and “the voluntary adoption of environmental management measures by enterprises”.

2. The items of tourism enterprises that are not suitable for protected areas are deleted. For example, “the enterprise relies on the overall understanding of the scenic area to obtain professionals”.

3. Four out of five scholars suggested that it is necessary to divide general pro-environmental behavior into the environmental activism behavior and environmental citizenship behavior according to Stern (1999).

The revised items were submitted to the experts again for review and were finally approved by consensus. The purified ecological value co-creation behavioral scale therefore included a total of 27 original question items (see Table 8), on the basis of which the subsequent quantitative analysis and question selection was carried out.

| No. | Title Item                                                                 | Source                        |
|-----|---------------------------------------------------------------------------|-------------------------------|
| 1   | Our enterprise is actively informed about ecological and environmental protection. | Cheng et al. (2013) [99]     |
| 2   | Our enterprise complies with the laws and regulations on ecological and environmental protection. | Cheng et al. (2013) [99]     |
| 3   | Our enterprise uses energy sparingly in the provision of its products and services. | Interview                     |
| 4   | Our enterprise uses environmentally friendly materials in the provision of our products and services. | Interview                     |
| 5   | Our enterprise disposes of waste materials generated from its operations and management. | Wu (2017) [102]              |
| 6   | Our enterprise actively participates in voluntary activities in the area of ecological protection. | Interview                     |
| 7   | Our enterprise promotes or popularizes information on ecological and environmental protection. | Interview                     |
| 8   | Our enterprise alerts or resists ecological damage.                         | Cheng et al. (2013) [99]     |
| 9   | Our enterprise voluntarily pays additional costs to restore and compensate for damage to the ecological environment. | Ramkissoon et al. (2013) [100] |
| 10  | Our enterprise exchanges information frequently with other businesses or organizations. | Xie (2013) [104]             |
| 11  | Our enterprise communicates openly and well with other enterprises or institutions. | Xie (2013) [104]             |
| 12  | Dialogue is used to resolve differences of opinion between the enterprise and other enterprises or organizations. | Interview                     |
| 13  | Our enterprise establishes shared information-sharing channels with other enterprises or organizations. | Interview                     |
| 14  | Our enterprise regularly interacts with other enterprises or organizations to discuss professional issues related to product services. | Geng (2005) [109]            |
| 15  | Our enterprise often acquires new knowledge about products and services from other enterprises or organizations. | Interview                     |
| 16  | Our enterprise learns and follows up on other enterprises’ or organizations’ innovations in ecological products and services. | Geng (2005) [109]            |
| 17  | Our enterprise voluntarily shares its experience and knowledge related to its products and services with other enterprises or organizations. | Ranjan and Read (2016) [53] |
| 18  | Our enterprise has been stimulated by other tourism-related businesses to work harder to improve its competitiveness. | Li (2012) [116]              |
| 19  | Our enterprise has a history of referring customers to other tourism-related enterprises. | Interview                     |
| 20  | Our enterprise has a history of collaborating with other tourism-related enterprises to develop products and services. | Interview                     |
| 21  | Our enterprise is better developed through cooperation with other tourism-related enterprises. | Li (2012) [116]              |
| 22  | Our enterprise cooperates with other tourism-related enterprises for mutual benefit. | Li (2012) [116]              |
| 23  | Our enterprise has helped to create a distinctive ecological tourism brand identity for the area. | Interview                     |
Table 8. Cont.

| No. | Title Item                                                                 | Source                      |
|-----|---------------------------------------------------------------------------|-----------------------------|
| 24  | Our enterprise helps scenic areas to build and maintain a good image of the place to visit. | Interview                   |
| 25  | Our enterprise helps to raise the profile of the scenic area.              | Interview                   |
| 26  | Our enterprise relies on external perceptions of the landscape as a whole to access customer resources. | Geng (2005) [109]           |
| 27  | Our enterprise is bound to regulate its own behavior in order to maintain the reputation of the scenic area. | Interview                   |

3.4. Psychometric Analysis

Sample 1 of the quantitative prestudy was collected through visits to more typical case sites in Guangdong province that rely on protected areas to develop ecological tourism in mid-March to the end of April 2022, including Shenzhen Dapeng, Huizhou Luofu mountain, Conghua hot springs, Zhaoqing Dinghu mountain, and Zhaoqing Xinghu Wetland Park. Shenzhen Dapeng is next to the Pingshan Marine protected area and mangrove peat protected area; Huizhou Luofu mountain is located in the Nankun primitive forest nature reserves. Conghua hot springs is next to the Chenhe cave wildlife protected areas and Zhaoqing Dinghu mountain (Xinghu wetland park is next to it) is the first protected area in China. We select the samples above because of the following two reasons: firstly, in order to maintain the consistency of case selection, all of the samples selected in Sample 1 are in the same province to the previous cases of qualitative study, which has the largest number of protected areas in China. Secondly, to cover more types of protected areas, we include marine protected areas, mangrove peat, primitive forest, and wildlife protected and wetland protected areas.

Three postgraduate students with a background in hospitality and tourism management were invited to distribute questionnaires to tourism enterprises at the case sites. A total of 190 questionnaires were distributed in the field and 184 valid questionnaires were collected, representing a 96.8% recovery rate. In total, 22 questionnaires were distributed online and 11 valid questionnaires were collected. The overall number of questionnaires collected was 195, with a valid questionnaire collection rate of 92.0%. Considering that the questionnaires distributed in the field were more in offline with the actual situation and that quality control could be carried out during the filling process, the data obtained in the field was used as the main part of this study. The basic information of Sample 1 is shown in Table 9, in which tourism enterprises have been operating in the scenic spot for an average of 7.08 years, and 76.4% of those who filled in the questionnaire belong to the management layer, with an average working time of 3.79 years in the enterprise, which is relatively representative of the understanding and knowledge of the enterprise situation.

Table 9. Descriptive statistical information for Sample 1.

| Indicators               | Category                                      | Number | Proportion |
|-------------------------|-----------------------------------------------|--------|------------|
| Sample source           | Shenzhen Dapeng                               | 72     | 36.9%      |
|                         | Huizhou Luofu Mountain                        | 47     | 24.1%      |
|                         | Conghua Hot Spring                            | 23     | 11.8%      |
|                         | Zhaoqing Dinghu Mountain                      | 23     | 11.8%      |
|                         | Zhaoqing Xinghu National Wetland Park         | 19     | 9.7%       |
|                         | Other (online)                                | 11     | 5.6%       |
| Main business           | Accommodation                                 | 137    | 70.3%      |
|                         | Food and Beverage                             | 19     | 9.7%       |
|                         | Retail                                        | 19     | 9.7%       |
|                         | Travel Agents                                 | 2      | 1.0%       |
|                         | Other                                         | 18     | 9.2%       |
The sample was first grouped into high and low groups, with the top 33% of the total score being identified as the high group and the bottom 33% of the total score being identified as the low group, on the basis of which an independent sample t-test was conducted for each item in these two groups. The t-value obtained was the decisive value of the item, which could be used to decide whether to retain this question item. In this study, the 195 enterprises were ranked according to their total score. The 66th (33%) enterprise with a total score of 264 and 65 enterprises with a total score greater than or equal to this value formed the high group of the study. The 130th (67%) enterprise with a total score of 231 and 65 enterprises with a total score less than or equal to this value formed the low group of the study. In total, 27 question items had the required decision values, and no adjustment was made to the questions at this step.

Table 10 showed the results of the above two tests, indicating high sample adequacy and providing statistical legitimacy for subsequent exploratory factor analysis level support.

Table 10. KMO and Bartlett’s test.

| KMO     | 0.894 |
|---------|-------|
| Bartlett’s test |     |
| Approximate cardinality | 3049.154 |
| df      | 351   |
| Sig.    | 0.000 |

This study completed the factor extraction by judging factor loading and cross-loading. After several iterations of exploration, the question items with low factor loading and high cross-loading were removed. Question items 17 and 18 were removed, as the loading on all factors was below 0.5. This left 25 question items with loading on six factors (see Table 11). The top six factors explained 67.720% of the variance, with all characteristic roots greater than 1. None of the remaining factors could explain more than 4.5% of the variance, which was typical of rubble disturbance factors and was not retained. The final ecological value co-creation behavior scale retains 25 items belonging to six factors, named environmental activism behavior, environmental citizenship behavior, dialogue communication behavior, knowledge-sharing behavior, co-opetition behavior, and destination reputation-building behavior.

Table 11. Rotated component matrix.

| Questions                                                                 | Environmental Activism Behavior | Environmental Citizenship Behavior | Dialogue Communication Behavior | Knowledge Sharing Behavior | Co-Opetition Behavior | Destination Reputation Building Behavior |
|--------------------------------------------------------------------------|---------------------------------|-----------------------------------|---------------------------------|----------------------------|-----------------------|------------------------------------------|
| 1. Our enterprise is actively informed about ecological and environmental protection. | 0.611                           |                                   |                                 |                            |                       |                                          |
| 2. Our enterprise complies with the laws and regulations on ecological and environmental protection. | 0.692                           |                                   |                                 |                            |                       |                                          |
| 3. Our enterprise uses energy sparingly in the provision of its products and services. | 0.803                           |                                   |                                 |                            |                       |                                          |
| 4. Our enterprise uses environmentally friendly materials in the provision of our products and services. | 0.681                           |                                   |                                 |                            |                       |                                          |
| 5. Our enterprise disposes of waste materials generated from its operations and management. | 0.593                           |                                   |                                 |                            |                       |                                          |
| 6. Our enterprise actively participates in voluntary activities in the area of ecological protection. |                                |                                   |                                 |                            |                       |                                          |
| 7. Our enterprise promotes or popularizes information on ecological and environmental protection. |                                |                                   |                                 |                            |                       |                                          |
| 8. Our enterprise alerts or resists ecological damage.                      |                                |                                   |                                 |                            |                       |                                          |
| 9. Our enterprise voluntarily pays additional costs to restore and compensate for damage to the ecological environment. |                                |                                   |                                 |                            |                       |                                          |
Table 11. Cont.

| Questions                                                                 | Environmental Activism Behavior | Environmental Citizenship Behavior | Dialogue Communication Behavior | Knowledge Sharing Behavior | Co-Opetition Behavior | Destination Reputation Building Behavior |
|---------------------------------------------------------------------------|---------------------------------|-----------------------------------|---------------------------------|---------------------------|-----------------------|------------------------------------------|
| 10. Our enterprise exchanges information frequently with other businesses or organizations. | 0.695                           |                                   |                                 |                           |                       |                                          |
| 11. Our enterprise communicates openly and well with other enterprises or institutions. | 0.689                           |                                   |                                 |                           |                       |                                          |
| 12. Dialogue is used to resolve differences of opinion between the enterprise and other enterprises or organizations. | 0.616                           |                                   |                                 |                           |                       |                                          |
| 13. Our enterprise establishes shared information-sharing channels with other enterprises or organizations. |                                   |                                   |                                 |                           |                       |                                          |
| 14. Our enterprise regularly interacts with other enterprises or organizations to discuss professional issues related to product services. |                                   |                                   |                                 |                           |                       |                                          |
| 15. Our enterprise often acquires new knowledge about products and services from other enterprises or organizations. |                                   |                                   |                                 |                           |                       |                                          |
| 16. Our enterprise learns and follows up on other enterprises’ or organizations’ innovations in ecological products and services. |                                   |                                   |                                 |                           |                       |                                          |
| 17. Our enterprise voluntarily shares its experience and knowledge related to its products and services with other enterprises or organizations. |                                   |                                   |                                 |                           |                       |                                          |
| 18. Our enterprise has been stimulated by other tourism-related businesses to work harder to improve its competitiveness. |                                   |                                   |                                 |                           |                       |                                          |
| 19. Our enterprise has a history of referring customers to other tourism-related enterprises. | 0.563                           |                                   |                                 |                           |                       |                                          |
| 20. Our enterprise has a history of collaborating with other tourism-related enterprises to develop products and services. |                                   |                                   |                                 |                           |                       |                                          |
| 21. Our enterprise is better developed through cooperation with other tourism-related enterprises. | 0.770                           |                                   |                                 |                           |                       |                                          |
| 22. Our enterprise cooperates with other tourism-related enterprises for mutual benefit. | 0.790                           |                                   |                                 |                           |                       |                                          |
| 23. Our enterprise has helped to create a distinctive ecological tourism brand identity for the area. |                                   |                                   |                                 |                           |                       | 0.694                                     |
| 24. Our enterprise helps scenic areas to build and maintain a good image of the place to visit. |                                   |                                   |                                 |                           |                       | 0.742                                     |
| 25. Our enterprise helps to raise the profile of the scenic area. |                                   |                                   |                                 |                           |                       | 0.707                                     |
| 26. Our enterprise relies on external perceptions of the landscape as a whole to access customer resources. |                                   |                                   |                                 |                           |                       | 0.697                                     |
| 27. Our enterprise is bound to regulate its own behavior in order to maintain the reputation of the scenic area. |                                   |                                   |                                 |                           |                       | 0.712                                     |

In this paper, the internal consistency coefficient (Cronbach’s $\alpha$) was chosen to test the reliability of the measurement items. A CITC value greater than 0.35 is the minimum threshold for the reliability of the sample data to pass the test. Following the principles and steps of scale purification, the author analyzed the measured items of the six variables. As shown in the Table 12, the CITC of all question items was greater than 0.35.

However, the Cronbach’s alpha coefficient of the measurement items increased after the deletion of three question items, 10, 13 and 26, so these three items were removed. Key measures are shown in Table 13.
Table 12. CITC and reliability of the questionnaire measurement question items.

| Corrected Item Total Correlation | Cronbach’s α Value for the Deleted Item |
|----------------------------------|----------------------------------------|
| 1. Our enterprise is actively informed about ecological and environmental protection. 0.523 | 0.800 | 0.811 |
| 2. Our enterprise complies with the laws and regulations on ecological and environmental protection. 0.557 | 0.791 |
| 3. Our enterprise uses energy sparingly in the provision of its products and services. 0.694 | 0.745 |
| 4. Our enterprise uses environmentally friendly materials in the provision of our products and services. 0.631 | 0.765 |
| 5. Our enterprise disposes of waste materials generated from its operations and management. 0.618 | 0.769 |
| 6. Our enterprise actively participates in voluntary activities in the area of ecological protection. 0.502 | 0.764 | 0.777 |
| 7. Our enterprise promotes or popularizes information on ecological and environmental protection. 0.653 | 0.684 |
| 8. Our enterprise alerts or resists ecological damage. 0.587 | 0.730 |
| 9. Our enterprise voluntarily pays additional costs to restore and compensate for damage to the ecological environment. 0.613 | 0.709 |
| 10. Our enterprise exchanges information frequently with other businesses or organizations. 0.741 | 0.762 | 0.846 |
| 11. Our enterprise communicates openly and well with other enterprises or institutions. 0.740 | 0.759 |
| 12. Dialogue is used to resolve differences of opinion between the enterprise and other enterprises or organizations. 0.663 | 0.835 |
| 13. Our enterprise establishes shared information-sharing channels with other enterprises or organizations. 0.636 | 0.889 | 0.881 |
| 14. Our enterprise regularly interacts with other enterprises or organizations to discuss professional issues related to product services. 0.776 | 0.835 |
| 15. Our enterprise often acquires new knowledge about products and services from other enterprises or organizations. 0.793 | 0.829 |
| 16. Our enterprise learns and follows up on other enterprises’ or organizations’ innovations in ecological products and services. 0.778 | 0.836 |
| 17. Our enterprise has a history of referring customers to other tourism-related enterprises. 0.563 | 0.844 | 0.841 |
| 18. Our enterprise has a history of collaborating with other tourism-related enterprises to develop products and services. 0.704 | 0.793 |
| 19. Our enterprise is better developed through cooperation with other tourism-related enterprises. 0.711 | 0.787 |
| 20. Our enterprise cooperates with other tourism-related enterprises for mutual benefit. 0.753 | 0.764 |
| 21. Our enterprise has helped to create a distinctive ecological tourism brand identity for the area. 0.694 | 0.792 | 0.838 |
| 22. Our enterprise helps scenic areas to build and maintain a good image of the place to visit. 0.759 | 0.773 |
| 23. Our enterprise helps to raise the profile of the scenic area. 0.733 | 0.779 |
| 24. Our enterprise relies on external perceptions of the landscape as a whole to access customer resources. 0.474 | 0.855 |
| 25. Our enterprise is bound to regulate its own behavior in order to maintain the reputation of the scenic area. 0.595 | 0.822 |

Table 13. Key Measures.

| Factor Name | Cronbach’s α | CR       |
|-------------|--------------|----------|
| Environmental activism behavior | 0.811 | 0.8049 |
| Environmental citizenship behavior | 0.777 | 0.7847 |
| Dialogue communication behavior | 0.846 | 0.8004 |
| Knowledge-sharing behavior | 0.889 | 0.7774 |
| Co-opetition behavior | 0.844 | 0.8139 |
| Reputation building behavior | 0.853 | 0.8478 |

| Environmental activism behavior | Average Value | Standard Deviation |
|---------------------------------|---------------|--------------------|
| Environmental citizenship behavior | 5.91 | 0.97 |
| Dialogue communication behavior | 5.46 | 1.12 |
| Knowledge-sharing behavior | 5.68 | 1.07 |
| Co-opetition behavior | 5.11 | 1.36 |
| Reputation building behavior | 5.60 | 1.28 |

Note: ** indicates significant correlation at the 0.01 level (bilateral).

As exploratory factor analysis can only be used to find and discover a model; it cannot be used to determine whether a particular model is sound or not. In order to verify the stability of the ecological value co-creation behavior model of tourism enterprises in
protected areas, confirmatory factor analysis needs to be used. In this study, AMOS 17.0 statistical software was used to analyze the re-collected Sample 2.

Sample 2 was mainly obtained by visiting typical case sites in China where ecological tourism is developed based on protected areas, including Zhangjiajie Tianmen Mountain and Wulingyuan, Hunan province and Mount Huang, Anhui province in late April 2022, and three postgraduate students with a background in tourism management were invited to distribute questionnaires to tourism enterprises in the case study areas. All three cases are China’s 5A tourism destinations, and Wulingyuan and Mount Huang are also UNESCO World Heritage Sites. Wulingyuan and Tianmen Mountain are located in the Zhangjiajie protected areas, which is the first nation-level forest park in China, which has 40 years history. Mount Huang is one of the most famous mountains in China, and there are a total of nine protected areas in Mount Huang, including three national-level protected areas and six province-level protected areas. A total of 200 questionnaires were distributed in the field and 194 valid questionnaires were collected, with a recovery rate of 97.0%. In total, 30 questionnaires were distributed online and 26 valid questionnaires were collected with a recovery rate of 86.7%. Overall, 220 valid questionnaires were collected, and since 22 items were retained after exploratory factor analysis, the minimum sample size requirement of at least 10 times the number of scale items for confirmatory factor analysis was met. The basic information of the sample is shown in Table 14, in which the average length of time tourism enterprises have been operating in the scenic area was 5.5 years, and 79.1% of those who filled in the questionnaire belong to the management. The average length of time they have worked in the enterprise was 3.9 years, so their knowledge and understanding of the enterprise situation was relatively representative.

| Indicators          | Category       | Number | Proportion |
|---------------------|----------------|--------|------------|
| Sample source       | Wulingyuan     | 75     | 34.1%      |
| Sample source       | Tianmen Mountain| 34     | 15.5%      |
| Sample source       | Mount Huang    | 85     | 38.6%      |
| Sample source       | Other (online) | 26     | 11.8%      |
| Main business       | Accommodation  | 123    | 55.9%      |
| Main business       | Food&Beverage  | 45     | 20.5%      |
| Main business       | Retail         | 41     | 18.6%      |
| Main business       | Travel agents  | 10     | 4.5%       |
| Main business       | Other          | 1      | 0.5%       |

The six-factor model of environmental activism behavior, environmental citizenship behavior, dialogue communication behavior, knowledge-sharing behavior, co-opetition behavior, and destination reputation building behavior, which is denoted as M6, is examined and compared with the one-dimensional model of ecological value co-creation behavior of tourism enterprises, which is denoted as M1, with 22 observed variables pointing directly to protected areas. The unidimensional model of co-creation behavior is compared with a one-dimensional model of the ecological value co-creation behavior of tourism enterprises in protected areas. The revised model for M6 is denoted as M6’, as suggested by the AMOS correction indicator. The results show that the six-factor model outperforms the unidimensional model, but the fit of the modified six-factor model is still not particularly satisfactory.

As the same batch of data can be fitted by multiple models, the aim of modeling is to find the model with a better fit. Considering that there is no mature theoretical model for ecological value co-creation behavior, the stability of the six-factor model lacks sufficient theoretical support, so this study analyzed the five-factor model, the four-factor model, the three-factor model and the two-factor model through several iterations. It was found that the items with a standardized path coefficient (factor loading) value below 0.7 (including five questions on environmental activism behavior, one question on environmental
citizenship behavior and four questions on reputation-building behavior) were removed. In the end, the four-factor model M4, which retained environmental citizenship behavior, dialogue communication behavior, knowledge-sharing behavior, and co-opetition behavior, had the best fit index. According to AMOS's correction index recommendation, the revised model of M4 is denoted as M4'. All the indicators of this model met the criteria. Therefore, M4', the model with the highest overall fitness was used in this study for the subsequent reliability and validity test see Table 15.

Table 15. Comparison of the fit of the models.

| Standard | Absolute Goodness of Fit Index | Value-Added Goodness of Fit Index | Simplified Goodness of Fit Index |
|----------|---------------------------------|----------------------------------|---------------------------------|
|          | $\chi^2/df$ | RMR | RMSEA | NFI | RFI | IFI | TLI | CFI | PGFI | PNFI |
| M6       | 897.663 | 3.990 | 0.167 | 0.736 | 0.729 | 0.788 | 0.782 | 0.788 | 0.610 | 0.717 |
| M6'      | 687.556 | 3.154 | 0.140 | 0.798 | 0.786 | 0.852 | 0.843 | 0.852 | 0.665 | 0.753 |
| M4       | 405.931 | 5.486 | 0.170 | 0.823 | 0.814 | 0.851 | 0.842 | 0.851 | 0.614 | 0.781 |
| M4'      | 176.195 | 3.091 | 0.102 | 0.915 | 0.901 | 0.941 | 0.931 | 0.940 | 0.650 | 0.790 |

As shown in Table 16, the results of the confirmatory factor analysis show that the SMC of the 12 question items are all greater than 0.4. The combined reliability CR for all four dimensional factors is above 0.7, and the scale has high reliability.

Table 16. Scale reliability verification test results.

| Factor                | Measurement | Projects | Confirmatory Factor Analysis | Standardization Load Value | T-Value | p-Value | CITC | Cronbach’s $\alpha$ | Portfolio Reliability CR | Average Variance Extraction Value AVE | Multirelated Square SMC |
|-----------------------|-------------|----------|------------------------------|-----------------------------|---------|---------|------|---------------------|------------------------|--------------------------|-------------------------|
| Environmental citizenship behavior | ECB2 | 0.706 | 3.105 | ** | 0.743 | 0.498 |
| behavior              | ECB3 | 0.695 | 3.116 | ** | 0.721 | 0.483 |
| Dialogue               | D1  | 0.778 | 3.100 | ** | 0.600 | 0.606 |
| communication behavior | D2  | 0.752 | 2.756 | ** | 0.768 | 0.768 |
| behavior              | D3  | 0.766 | 2.752 | ** | 0.803 | 0.565 |
| Knowledge              | KS1 | 0.760 | 2.771 | ** | 0.740 | 0.655 |
| sharing               | KS2 | 0.816 | 7.714 | *** | 0.796 | 0.665 |
| behavior              | KS3 | 0.815 | 7.707 | *** | 0.852 | 0.665 |
| Co-opetition behavior | CB1 | 0.819 | 7.752 | *** | 0.854 | 0.671 |
| behavior              | CB2 | 0.839 | 12.151 | *** | 0.734 | 0.703 |
| Co-opetition behavior | CB3 | 0.763 | 10.927 | *** | 0.738 | 0.582 |

Note: ** indicates significant at the 0.01 level, *** indicates significant at the 0.001 level.

The validity mainly consists of content validity, structural validity and calibration scales. The content validity of the scale refers to whether the questions, tasks and items included in the scale are representative samples of the behavior of the target population. Experts in the field of ecological tourism were invited to analyze and control each step of the scale development, so the scale developed in this study has a good content validity. Convergent validity is the degree of correlation between different measures within the same structure [128]. Differentiated validity is used to measure the degree of difference between a dimension and other dimensions in the dimensional structure in terms of traits [129]. Calibration validity is often chosen to test the scale’s predictive validity mainly to test the extent to which the scale is able to predict future variables that are the same as or different from the variable being measured [130]. With the exception of content validity, the above tests of validity are mainly carried out by conducting confirmatory factor analysis on Sample 2.

Aggregate validity is judged by three main criteria. The average variance extraction AVE is greater than 0.5, standardized factor loading is greater than 0.5 and significant, and the combined reliability CR is greater than 0.7, which indicates high aggregate validity.
From Table 17, it can be seen that the AVE of the four factors of scale is distributed between 0.5289 and 0.6669, all of which are greater than 0.5. The combined reliability of the four factors of scale is distributed between 0.7706 and 0.8573, all of which are greater than 0.7. The standardized factor loading of scale question items is distributed between 0.695 and 0.839, which are all greater than 0.5 and all significant at the 0.01 level. Combining these three indicators, it can be found that scale has a good aggregated validity.

There are three main criteria for distinguishing between high and low validity. The difference in cardinality values between the restricted and unrestricted models generated for a single cluster was compared. If the amount of difference in cardinality is greater and reaches significance, this indicates a significant difference between the two models and a high discriminant validity. If the square root of the AVE is greater than the correlation coefficient between the dimensions, then the differentiation validity is higher. The correlation coefficients between all items are below 0.85, which indicates good discrimination validity. The correlation coefficients between the dimensions are shown in Table 17 and are all below 0.85, which indicates good discriminant validity for scale.

| Latent Variables                  | Environmental Citizenship Behavior | Dialogue Communication Behavior | Knowledge Sharing Behavior | Co-Opetition Behavior |
|----------------------------------|------------------------------------|--------------------------------|----------------------------|-----------------------|
| Environmental citizenship behavior | 0.727                              |                                |                            |                       |
| Dialogue communication behavior   | 0.694 **                           | 0.759                          |                            |                       |
| Knowledge sharing behavior       | 0.650 **                           | 0.663 **                       | 0.817                      |                       |
| Co-opetition behavior            | 0.480 **                           | 0.546 **                       | 0.724 **                   | 0.809                 |

Note: Diagonal values are the square root of the AVE value for that dimension; ** indicates significant correlation at the 0.01 level (two-sided).

In conducting the differentiation validity test, in order to verify whether the four-dimensional model structure is the best model for measuring the ecological value co-creation behavior of tourism enterprises in protected areas, this study draws on Anderson and Gerbing’s (1988) [131], and 14 competing models were hypothesized in addition to the original model, including six three-factor models (in which two variables were combined), seven double-factor models (in which three variables were combined and two two variables were combined), and one single-factor model (in which four variables were combined). It can be seen that of the 14 competing models, only three three-factor models and one single-factor model could be fitted to the model. The fit indices are shown in Table 18. Compared to the competing models, the four-factor model has the best fit index and the amount of change in \( \chi^2 \) is significantly different, indicating that the four homologous variables can be effectively distinguished from each other, and the scale has a better differentiation validity.

| Models                        | \( \chi^2 \)   | \( \Delta \chi^2 \) | Sig. | \( \chi^2/df \) | RMR | RMSEA | NFI | RFI | IFI | TLI | CFI |
|-------------------------------|----------------|---------------------|------|----------------|-----|--------|-----|-----|-----|-----|-----|
| Four-factor model             | 176.195        |                    |      | 0.102          | 0.098 | 0.915  | 0.901 | 0.941 | 0.931 | 0.940 |
| Three-factor model 1 ECB + CB | 327.435        | 151.240            | **   | 0.199          | 0.143 | 0.841  | 0.826 | 0.867 | 0.853 | 0.866 |
| Three-factor model 2 D + CB   | 351.258        | 175.063            | **   | 0.195          | 0.149 | 0.830  | 0.813 | 0.855 | 0.840 | 0.854 |
| Three-factor model 3 KS + CB  | 238.627        | 62.432             | *    | 0.148          | 0.117 | 0.884  | 0.873 | 0.911 | 0.902 | 0.911 |
| Single-factor model           | 384.383        | 208.188            | **   | 0.210          | 0.154 | 0.814  | 0.802 | 0.839 | 0.828 | 0.839 |

Note: ** indicates significant at the 0.01 level, * indicates significant at the 0.5 level.

In order to validate the predictive validity of the scale, an antecedent variable of ecological value co-creation behavior was selected for testing, namely the influence of the interdependence between tourism enterprises and other core subjects in protected areas on ecological value co-creation behavior.
Interdependence refers to the extent to which people need the help of partners to engage in individual and joint behaviors. According to resource dependency theory and cooperation cost analysis theory, dependency is a determinant of the form of governance [132]. In the development of ecological tourism in protected areas, tourism enterprises depend on protected areas as ecological resource providers to develop. It is a dependency and consumer of ecological value. In addition, the relationship between tourism enterprises and management agencies is also interdependent. Tourism enterprises cannot operate and develop without the planning and policy support of local management bodies. The support and cooperation of tourism enterprises is essential for the management bodies to carry out their functions of safeguarding ecological resources and providing management services. The interdependence between tourism enterprises is due to the commonality and complementarity of the resources they possess, which makes it possible to cooperate in the development of tourism products and services while at the same time requiring each enterprise to enrich and improve the tourism products and service chain of the area, thus increasing the overall competitiveness of the destination. They are inseparable from each other and need to cooperate in co-creation. The interdependence that exists between ecosystem suppliers and consumers is a source of value creation and realization. This study builds on previous scholarly arguments regarding the relevance of interdependence to symbiosis co-creation and proposes the hypothesis as the following.

The interdependence of tourism enterprises with other core subjects in protected areas has a significant positive impact on ecological value co-creation behavior.

This study draws on the scale used by Lusch and Brown (1996) to measure the interdependence between tourism enterprises and other subjects in protected areas [133]. The scale contains 12 questions measuring tourism enterprises’ dependence on natural resources, tourism enterprises’ dependence on management bodies, tourism enterprises’ dependence on other enterprises, and other subjects’ dependence on tourism enterprises. When the questionnaire distribution for Sample 2 was conducted, the question items were increased by 12 interdependent questions. The internal consistency of the scales was tested to be good, with all Cronbach’s $\alpha$ greater than 0.7, as shown in Table 19.

Table 19. Internal consistency analysis of variable “interdependence”.

| Title Item                                                                 | Cronbach’s $\alpha$ for Dimensionality | Cronbach’s $\alpha$ for the Variables |
|----------------------------------------------------------------------------|----------------------------------------|---------------------------------------|
| Inter 1 The enterprise is dependent on the natural resource environment for its development. | 0.751                                  |                                       |
| Inter 2 The importance of the natural resource environment is irreplaceable. |                                       |                                       |
| Inter 3 The loss of the natural resource environment would be a great loss to the enterprise. |                                       |                                       |
| Inter 4 The enterprise is dependent on the scenic management body for its development. | 0.863                                  | 0.834                                 |
| Inter 5 The importance of landscape management bodies is difficult to replace. |                                       |                                       |
| Inter 6 The absence of a scenic management body would be a great loss to the enterprise. | 0.825                                  |                                       |
| Inter 7 The enterprise is dependent on other tourism enterprises for its development. |                                       |                                       |
| Inter 8 The importance of other tourism enterprises to our enterprise is difficult to replace. | 0.925                                  |                                       |
| Inter 9 It would be a great loss to the enterprise if there were no other tourism enterprises. |                                       |                                       |
| Inter 10 The landscape is dependent on the enterprise for its development. |                                       |                                       |
| Inter 11 The importance of this enterprise to the landscape is hard to replace. |                                       |                                       |
| Inter 12 The loss of this enterprise would be a great loss to the scenic area. |                                       |                                       |

In this study, a predictive model of interdependence to the ecological value co-creation behavior of tourism enterprises was constructed and analyzed using AMOS. It found that all fitted indicators were within acceptable limits ($\chi^2/df = 2.170$, RMSEA = 0.073, CFI = 0.913, IFI = 0.913, TLI = 0.907) and the standardized regression coefficient of interdependence on the ecological value co-creation behavior of tourism enterprises was 0.547, significant at the 0.001 level. It indicates that the ecological value co-creation behavior of tourism enterprises value co-creation behavior measurement scale has a good calibrated validity. The analytical structure of the predictive validity is specified in Figure 2.
Figure 2. Results of predictive validity analysis. Note: *** indicates significant at the 0.001 level, ** indicates significant at the 0.01 level and * indicates significant at the 0.05 level.

In summary, by conducting confirmatory factor analysis on Sample 2, it was found that the model had a good fit and the scale had high reliability and validity. It indicates that the ecological value co-creation behavior of tourism enterprises in protected areas creation behavior is a concept comprising four dimensions, including environmental citizenship behavior, dialogue communication behavior, knowledge-sharing behavior, and co-opetition behavior, which can be measured by 12 measures.

4. Discussion

A good ecological environment is the basis for the survival and development of tourism enterprises. Without a beautiful natural environment, there will be no tourists, and tourism enterprises that depend on tourists will have no source of income. Destination reputation is also the basis for the survival and development of tourism enterprises. Most of them are able to gain access to customer resources only because of the reputation of the destination. During the development of the scale, this study proposed that pro-environmental behavior and destination reputation construction behavior were important dimensions of ecological value co-creation behavior as well as were validated in the exploratory factor analysis stage. The study also divided pro-environmental behavior into two dimensions, including general environmental behavior and high involvement environmental behavior, rather than simply combining them in the same factor. General environmental behavior is the most elementary form of pro-environmental behavior, which can be undertaken by enterprises in their daily operations, such as understanding environmental information, complying with environmental regulations, saving energy, using environmentally friendly materials and disposing of waste. High-involvement environmental behavior requires tourism enterprises to invest more time, energy and money in environmental practices. In the exploratory factor analysis, a distinction was made between general environmental behavior and high involvement environmental behavior, and the latter was named "environmental behavior". Civic behavior is non-coercive behavior that is not directly or explicitly recognized by a formal reward system but which generally contributes to the effective functioning of the organization. On the other hand, environmental behavior is the voluntary and unpaid practice of tourism enterprises, which is more intrinsically driven than driven by financial gain or the intervention of external pressures. The distinction between the two is illustrated in Sample 1. The former is a way of preserving ecological value, and the latter is a way of adding value to ecological value, both of which are integral to ecological value co-creation.
However, a confirmatory factor analysis of Sample 2 found that when general environmental behavior was included as a dimension in the model for ecological value co-creation behavior, the model was found to be a poor fit with AVE values lower than 0.4. Neither the aggregated validity nor the differentiated validity of scale could reach the standard value. This was also the case for reputation-building behavior. Possible reasons for this include the wide range of structural dimensions of ecological value co-creation behavior and the lack of coherence between the dimensions due to differences in ecological tourism management models and development water in the case sites. For Sample 2, the statistical descriptive data shows that the mean values of each question item for general environmental behavior and reputation-building behavior are generally high, leading to differences in the data levels with the other four dimensions, which may therefore affect the stability of the six dimensions, while the four dimensions offer a better fit. From a practical point of view, Sample 2 collected data on tourism enterprises in Zhangjiajie and Mount Huang, both of which are relatively mature case sites for tourism development in China. Zhangjiajie developed ecological tourism started in 1978 and successively established Suoxiyu Nature Reserve, Zhangjiajie National Forest Park, Tianzi Mountain Nature Reserve, Wulingyuan Scenic Spot and Tianmen Mountain National Forest Park, experiencing the initial development stage, steady growth stage, rapid leap stage, adjustment and stabilization stage. The system is relatively mature. Mount Huang was established by the government in the 1930s and 1940s as the main force to participate in the development of Mount Huang, which has been selected as a World Cultural and Natural Heritage Site, a World Geological Park, one of the top ten scenic spots in China, a national scenic spot, etc. The current stage belongs to the mature and stable stage of the tourism development life cycle. The possible reason for this is that the destination reputation is formed earlier, which is more stable. It is not difficult to understand that tourism enterprises present a higher level of reputation-building behavior. The level of general environmental behavior is also higher than that of the other dimensions, resulting in lower correlation coefficients between general environmental behavior, reputation-building behavior and the other dimensions, thus leading to a poorer fit of the six-dimensional model see Tables 20 and 21.

Table 20. Descriptive statistics for Sample 2 original ecological value co-creation behavioral question items.

| Title Item | Average Value | Standard Deviation |
|------------|---------------|--------------------|
| PEB1       | 5.99          | 1.188              |
| PEB2       | 6.24          | 0.969              |
| PEB3       | 6.09          | 1.119              |
| PEB4       | 6.02          | 1.203              |
| PEB5       | 5.94          | 1.279              |
| ECB1       | 5.47          | 1.326              |
| ECB2       | 5.35          | 1.389              |
| ECB3       | 5.56          | 1.368              |
| ECB4       | 4.97          | 1.605              |
| D1         | 5.40          | 1.428              |
| D2         | 5.23          | 1.428              |
| D3         | 5.19          | 1.458              |
| KS1        | 4.83          | 1.675              |
| KS2        | 4.92          | 1.697              |
| KS3        | 4.92          | 1.697              |
| CB1        | 4.78          | 1.831              |
| CB2        | 5.05          | 1.719              |
| CB3        | 5.28          | 1.565              |
| CR1        | 5.79          | 1.291              |
| CR2        | 6.04          | 1.214              |
| CR3        | 5.83          | 1.266              |
| CR4        | 6.17          | 1.013              |
Table 21. Correlation analysis of the original ecological value co-creation behavioral dimension for Sample 2.

|                                | Average Value | Standard Deviation | Environmental Activism Behavior | Environmental Citizenship Behavior | Dialogue Communication Behavior | Knowledge Sharing Behavior | Co-Opetition Behavior | Reputation Building Behavior |
|--------------------------------|---------------|--------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------|-----------------------|-------------------------------|
| Environmental activism behavior| 6.06          | 0.89               |                                 |                                   |                               |                           |                       |                               |
| Environmental citizenship behavior| 5.34          | 1.22               | 0.494 **                        |                                   |                               |                           |                       |                               |
| Dialogue communication behavior| 5.27          | 1.30               | 0.399 **                        | 0.679 **                         |                               |                           |                       |                               |
| Knowledge sharing behavior     | 4.89          | 1.57               | 0.358 **                        | 0.649 **                         | 0.663 **                     |                           |                       |                               |
| Co-opetition behavior          | 5.04          | 1.53               | 0.293 **                        | 0.472 **                         | 0.546 **                     | 0.724 **                  |                       |                               |
| Reputation-building behavior   | 5.96          | 0.96               | 0.479 **                        | 0.425 **                         | 0.301 **                     | 0.421 **                 | 0.274 **              |                               |

Note: ** indicates significant correlation at the 0.01 level (bilateral).

5. Conclusions

This paper defines the ecological value co-creation of protected areas as “Based on their dependence on ecological resources, protected areas stakeholders interact, integrate and cooperate with each other to build and comply with the order and rules of development, to achieve a balance between conservation and development of ecological resources, in order to jointly create the maximum environmental value, social value and economic value”, and tourism enterprises play an important role, and their ecological value co-creation has a significant impact to the whole system.

Based on the symbiosis theory and value co-creation theory, this paper develops the scale of ecological value co-creation behavior of tourism enterprises in protected areas following the processes of Churchill and Margoda et al. In the qualitative research section, 14 interviewees in management committees, enterprises and NGOS from two protected areas in Guangdong, China were interviewed. According to the qualitative data analysis and theoretical analysis, 27 original question items were generated. After that, psychometric analysis was applied in this paper. A total of 195 questionnaires from tourism enterprises in five protected areas were used as Sample 1 for exploratory factor analysis; then, another 220 questionnaires were collected in another three protected areas as Sample 2 for confirmatory factor analysis to verify the stability of the ecological value co-creation behavior model of tourism enterprises in protected areas. The psychometric analysis of scale presented good internal consistency, reliability and validity. The results show that the ecological value co-creation behavior in protected areas is a multi-dimensional construct, which includes four dimensions: environmental behavior, dialogue communication behavior, knowledge-sharing behavior and co-opetition behavior, which can be assessed through 12 question items.

6. Research Limitations

Firstly, ecological value co-creation is a systematic activity and should be studied from the perspective of each stakeholder. However, considering the complexity of the stakeholders and the difficulty of research, this study focuses on the interaction between tourism enterprises and natural resources, between tourism enterprises and tourism enterprises, as well as between tourism enterprises and management bodies from the perspective of tourism enterprises. The interactions between other stakeholders such as tourists, communities and tourism enterprises were not included in the study. Secondly, the different management modes and development levels of ecological tourism in different protected
areas have led to different dimensions of ecological value co-creation behavior of tourism enterprises. Therefore, the generalizability of the study results needs to be further tested, especially the stability of the four dimensions needs to be further verified in the future so as to explore a multi-dimensional stability model applicable to different case sites.

**Author Contributions:** Conceptualization, K.N.; Data curation, K.N. and X.T.; Formal analysis, K.N.; Investigation, X.T.; Writing—original draft, K.N.; Writing—review & editing, K.N. All authors have read and agreed to the published version of the manuscript.

**Funding:** This study was supported by a grant from National Natural Science Foundation of China (to Liu Jingyan) (No. 72074233, No. 41471467).

**Acknowledgments:** We cannot express enough thanks to my colleagues for their support and encouragement: Jingyan Liu, who sponsored this research; Fangming Qin, Jingqi Niu and Jiaman Niu, who helped us to do the interviews and collect data. Please allow us to offer our sincere appreciation for helping us finish this research.

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

**References**

1. Duran, A.P. Effectiveness of Protected Areas and Implications for Conservation of Biodiversity and Ecosystem Services. *Geochim. Cosmochim. Acta* 2014, 125, 49–67. Available online: https://ore.exeter.ac.uk/repository/handle/10871/15826 (accessed on 15 December 2021).

2. Dudley, N. *Guidelines for Applying Protected Area Management Categories*; Iucn: Gland, Switzerland, 2008.

3. Mayer, M.; Müller, M.; Woltering, M.; Arnegger, J.; Job, H. The economic impact of tourism in six German national parks. *Lands. Urban Plan.* 2010, 97, 73–82. [CrossRef]

4. Mayer, M.; Job, H. The economics of protected areas—a European perspective. *Z. Wirtsch.* 2014, 58, 73–97. [CrossRef]

5. Job, H.; Paesler, F. Links between nature-based tourism, protected areas, poverty alleviation and crises—The example of Wasini Island (Kenya). *J. Outdoor Recreat. Tour.* 2013, 1–2, 18–28. [CrossRef]

6. Spenceley, A.; Schagner, J.P.; Engels, B.; Thomas, C.C.; Engelbauer, M.; Erkkonen, J.; Job, H.; Kajala, L.; Majewski, L.; Metzler, D.; et al. *Visitors Count! Guidance for Protected Areas on the Economic Analysis of Visitation*; German Federal Agency for Nature Conservation (BfN): Bonn, Germany, 2021.

7. Phillips, H.A. Human: Substance, Relationship, Choice, Value and Nature. *J. Med. Philos.* 2012, 37, 325–330. [CrossRef]

8. He, F.; Jin, J.; Zhang, H.; Yuan, L. The change of ecological service value and the promotion mode of ecological function in mountain development using InVEST model. *Arab. J. Geosci.* 2021, 14, 510. [CrossRef]

9. Li, Z.; Pan, J.; Hu, Y. Time and Space Change of Eco-capital Value and Ecology-Economy in Gansu Province. *J. Nat. Resour.* 2017, 32, 64–75.

10. Straton, A. A complex systems approach to the value of ecological resources. *Ecol. Econ.* 2006, 56, 402–411. [CrossRef]

11. Masud, M.M.; Aldakhil, A.M.; Nassani, A.A.; Azam, M.N. Community-based ecotourism management for sustainable development of marine protected areas in Malaysia. *Ocean Coast. Manag.* 2017, 136, 104–112. [CrossRef]

12. Fennell, D.A. *Ecotourism: An Introduction*, 2nd ed.; Routledge: London, UK, 2014; pp. 24–32.

13. Zhong, L.; Zhang, X.; Deng, J.; Pierskalla, C. Recreation ecology research in China’s protected areas: Progress and prospect. *Ecosyst. Health Sustain.* 2020, 6, 1813635. [CrossRef]

14. Tira, A.; Wilmott, I.K. The Takitumu Conservation Area: A community-owned ecotourism enterprise in the Cook Islands. *Ind. Environ.* 2001, 24, 42–47.

15. Zanamwe, C.; Gandiwa, E.; Muboko, N.; Kupika, O.L.; Mukamuri, B.B. An analysis of the status of ecotourism and related developments in the Zimbabwe’s component of the Great Limpopo Transfrontier Conservation Area. *Sustain. Environ.* 2020, 5, 14. [CrossRef]

16. Wijaya, W.; Damanik, J. Study on Ecotourism Development in Kapota Island Wakatobi Regency, Southeast Sulawesi Province. *E-J. Tour.* 2020, 7, 300–322. [CrossRef]

17. Brillo, B.B.C. Development of a small lake: Ecotourism enterprise for Pandin lake, San Pablo City, Philippines. *Lakes Reserv. Res. Manag.* 2016, 21, 284–292. [CrossRef]

18. Roberts, S.; Tribe, J. Exploring the economic sustainability of the small tourism enterprise: A case study of Tobago. *Tour. Recreat. Res.* 2005, 30, 55–72. [CrossRef]

19. Rodenburg, E.E. The effects of scale in economic development: Tourism in Bali. *Ann. Tour. Res.* 1980, 7, 177–196. [CrossRef]

20. Fassin, Y.; Van Rossem, A.; Buelens, M. Small-business owner-managers’ perceptions of business ethics and CSR-related concepts. *J. Bus. Ethics* 2011, 98, 425–453. [CrossRef]

21. Woodland, M.; Acott, T. Sustainability and local tourism branding in England’s South Downs. *J. Sustain. Tour.* 2007, 15, 715–734. [CrossRef]
22. Yüzbaşoğlu, N.; Topsakal, Y.; Çelik, P. Roles of tourism enterprises on destination sustainability: Case of Antalya, Turkey. *Procedia-Soc. Behav. Sci.* **2014**, *150*, 968–976. [CrossRef]

23. Wang, K.; Li, M.N.; Ge, Q.S. Environmental Behavior of Tourism Enterprises in the World Heritage Sites and Its Driving Mechanism; An Empirical Study on Tourist Hotels in Zhangjiajie. *Tour. Trib. Xuekan* **2012**, *27*, 64–73.

24. Kilipiris, F.; Zardava, S. Developing sustainable tourism in a changing environment: Issues for the tourism enterprises (travel agencies and hospitality enterprises). *Procedia-Soc. Behav. Sci.* **2012**, *44*, 44–52. [CrossRef]

25. Lasso, M.A.H. The Double-edged Sword of Tourism: Tourism Development and Local Livelihoods in Komodo District, East Nusa Tenggara, Indonesia. Ph.D. Thesis, Griffith University, Queensland, Australia, 2017.

26. Izurietta, G.; Torres, A.; Patino, J.; Vasco, C.; Vasseur, L.; Reyes, H.; Torres, B. Exploring community and key stakeholders’ perception of scientific tourism as a strategy to achieve SDGs in the Ecuadorian Amazon. *Tour. Manag. Perspect.* **2021**, *39*, 100830. [CrossRef]

27. Altinay, L.; Sigala, M.; Waligo, V. Social value creation through tourism enterprise. *Tour. Manag.* **2016**, *54*, 404–417. [CrossRef]

28. Quyet, L.; Duy, P.; Toan, V. Sustainable development of tourism economy in Phu Quoc Island, Kien Giang Province, Vietnam: Current situation and prospects. In *IOP Conference Series: Earth and Environmental Science*; IOP Publishing: Bristol, UK, 2022; Volume 1028, p. 012005. [CrossRef]

29. Tervo-Kankare, K. Entrepreneurship in nature-based tourism under a changing climate. *Curr. Issues Tour.* **2019**, *22*, 1380–1392. [CrossRef]

30. Zambroano-Monserrate, M.A.; Silva-Zambrano, C.A.; Ruano, M.A. The economic value of natural protected areas in Ecuador: A case of Villamil Beach National Recreation Area. *Ocean. Coast. Manag.* **2018**, *157*, 193–202. [CrossRef]

31. do Val Simardi Beraldo Souza, T.; Thapa, B.; Rodrigues, C.G.d.O.; Imori, D. Economic impacts of tourism in protected areas of Brazil. *J. Sustain. Tour.* **2019**, *27*, 735–749. [CrossRef]

32. Gaodirelwe, I.; Masunga, G.S.; Motsholapheko, M.R. Community-based natural resource management: A promising strategy for reducing subsistence poaching around protected areas, northern Botswana. *Environ. Dev. Sustain.* **2020**, *22*, 2269–2287. [CrossRef]

33. De Bary, A. Die Erscheinung der Symbiose: Vortrag Gehalten auf der Versammlung Deutscher Naturforscher und Aerzte zu Cassel; Trübner: Strasbourg, France, 1879.

34. Scott, G.D. Plant symbiosis. *Edward Arnold* 1969, 15–16. Available online: https://onlinelibrary.wiley.com/doi/epdf/10.1002/jobm.19700100821 (accessed on 15 December 2021).

35. Margulis, L. Symbiosis in evolution: Origins of cell motility. In *Evolution of Life*; Springer: Berlin/Heidelberg, Germany, 1991; pp. 305–324.

36. Chertow, M.R. “Uncovering” industrial symbiosis. *J. Ind. Ecol.* **2007**, *11*, 11–30. [CrossRef]

37. Zhou, W.; Yu, C.; Zhou, Y. Consensus, symbiosis and a win-win situation: The process model of value co-creation. *Sci. Res. Manag.* **2015**, *36*, 129–135. [CrossRef]

38. Gross, E. Symbiosis and consensus as integrative factors in small groups. *Am. Sociol. Rev.* **1956**, *21*, 174–179. [CrossRef]

39. Hill, J.P.; Vaidyanathan, B. Substitution or symbiosis? Assessing the relationship between religious and secular giving. *Soc. Forces* **2011**, *90*, 157–180. [CrossRef]

40. Lessard, J.M.; Habert, G.; Tagnit-Hamou, A.; Amor, B. A time-series material-product chain model extended to a multiregional industrial symbiosis: The case of material circularity in the cement sector. *Ecol. Econ.* **2021**, *179*, 106872. [CrossRef]

41. Bijon, N.; Wassenaar, T.; Junqua, G.; Dechene, M. Towards a sustainable bioeconomy through industrial symbiosis: Current situation and perspectives. *Sustainability* **2022**, *14*, 1605. [CrossRef]

42. Payne, A.F.; Storbacka, K.; Frow, P. Managing the co-creation of value. *J. Acad. Mark. Sci.* **2008**, *36*, 83–96. [CrossRef]

43. Vargo, S.L.; Lusch, R.F. It’s all B2B… and beyond: Toward a systems perspective of the market. *Ind. Mark. Manag.* **2011**, *40*, 181–187. [CrossRef]

44. Zomerdijk, L.G.; Voss, C.A. Service design for experience-centric services. *J. Serv. Res.* **2010**, *13*, 67–82. [CrossRef]

45. Cabiddu, F.; Lui, T.W.; Piccoli, G. Managing value co-creation in the tourism industry. *Ann. Tour. Res.* **2013**, *42*, 86–107. [CrossRef]

46. Zhang, X.; Chen, R. Examining the mechanism of the value co-creation with customers. *Int. J. Prod. Econ.* **2008**, *116*, 242–250. [CrossRef]

47. Normann, R.; Ramirez, R. Designing Interactive Strategy: From Value Chain to Value Constellation; University of Oxford: Oxford, UK, 1998; pp. 1620–1630.

48. Vargo, S.L.; Lusch, R.F. Service-dominant logic: Continuing the evolution. *J. Acad. Mark. Sci.* **2008**, *36*, 1–10. [CrossRef]

49. Prahalad, C.K.; Ramaswamy, V. Co-creation experiences: The next practice in value creation. *J. Interact. Mark.* **2004**, *18*, 5–14. [CrossRef]

50. Prahalad, C.K.; Ramaswamy, V. Co-opting customer competence. *Harv. Bus. Rev.* **2000**, *78*, 79–90.

51. Ranjan, K.R.; Read, S. Value co-creation: Concept and measurement. *J. Acad. Mark. Sci.* **2016**, *44*, 290–315. [CrossRef]

52. Yi, Y.; Gong, T. Customer value co-creation behavior: Scale development and validation. *J. Bus. Res.* **2013**, *66*, 1279–1284. [CrossRef]
55. Vega-Vázquez, M.; Revilla-Camacho, M.Á.; Cossio-Silva, F.J. The value co-creation process as a determinant of customer satisfaction. *Manag. Decis. Sci.* 2013, 51, 1945–1953. [CrossRef]

56. Forsström, B. Value Co-Creation in Industrial Buyer-Seller Partnerships-Creating and Exploiting Interdependencies: An Empirical Case Study. Åbo Akademi University Press: Turku, Finland, 2005.

57. Saarijärvi, H.; Kannan, P.; Kuusela, H. Value co-creation: Theoretical approaches and practical implications. *Eur. Bus. Rev.* 2013, 25, 6–19. [CrossRef]

58. Ramaswamy, V.; Gouillart, F. Building the co-creative enterprise. *Harv. Bus. Rev.* 2010, 88, 100–109.

59. Nenonen, S.; Storbacka, K. Business model design: Conceptualizing networked value co-creation. *Int. J. Qual. Serv. Sci.* 2010, 2, 43–59.

60. Storbacka, K.; Frow, P.; Nenonen, S.; Payne, A. Designing business models for value co-creation. In *Special Issue—Toward a Better Understanding of the Role of Value in Markets and Marketing*; Emerald Group Publishing Limited: Bingley, UK, 2012; Volume 9, pp. 51–78.

61. Zhang, C.; Hong, X.U. A Study on Value Co-creation of the Core Subjects of the Exhibition under the Grounded Theory. *Tour. Forum* 2017, 10, 1–11.

62. Gao, Z.; Liu, W.; Gao, J. Value Co-Creation Mechanism of Logistics Service Supply Chain under Service-Dominant Logic. *China Bus. Mark.* 2014, 28, 71–77.

63. Balapandit, I.; Vlastaris, I.; Xezonakis, G.; Karagkiozoglou, M. ‘Bridges Over Troubled Waters’? The Competitive Symbiosis of Social Democracy and Radical Left in Crisis-Ridden Southern Europe. *Gov. Oppos.* 2021, 56, 59–81. [CrossRef]

64. Razdorskaya, O. Reflection and creativity: The need for symbiosis. *Procedia-Soc. Behav. Sci.* 2015, 209, 433–438. [CrossRef]

65. Ntasiou, M.; Andreou, E. The standard of industrial symbiosis. Environmental criteria and methodology on the establishment and operation of industrial and business parks. *Procedia Environ. Sci.* 2017, 38, 744–751. [CrossRef]

66. Chen, X.; Dong, M.; Zhang, L.; Luan, X.; Cui, X.; Cui, Z. Comprehensive evaluation of environmental and economic benefits of industrial symbiosis in industrial parks. *J. Clean. Prod.* 2022, 354, 131635. [CrossRef]

67. Budowski, G. Tourism and environmental conservation: Conflict, coexistence, or symbiosis? *Environ. Conserv.* 1976, 3, 27–31. [CrossRef]

68. Yang, C.; Huang, J.; Lin, Z.; Zhang, D.; Zhu, Y.; Xu, X.; Chen, M. Evaluating the symbiosis status of tourist towns: The case of Guizhou Province, China. *Ann. Tour. Res.* 2018, 72, 109–125. [CrossRef]

69. Robinson, R.N.; Baum, T.; Golubovskaya, M.; Solnet, D.J.; Callan, V. Applying endosymbiosis theory: Tourism and its young workers. *Ann. Tour. Res.* 2019, 78, 102751. [CrossRef]

70. Peterson, G. Four corners of human ecology: Different paradigms of human relationships with the earth. In *Nature and the Human Spirit: Toward an Expanded Land Management Ethic*; Venture: State College, PA, USA, 1996.

71. Nakamura, H. A framework for a possible symbiosis between man and nature: historical changes in the concepts of nature, science, and technology. *Scand. J. Med. Sci. Sport.* 2015, 45, 374–379.

72. Liu, J.; Qu, H.; Huang, D.; Chen, G.; Yue, X.; Zhao, X.; Liang, Z. The role of social capital in encouraging residents’ pro-environmental behaviors in community-based ecotourism. *Tour. Manag.* 2014, 41, 190–201. [CrossRef]

73. Ferreira, S.L. Balancing people and park: Towards a symbiotic relationship between Cape Town and Table Mountain National Park. *Curr. Issues Tour. 2011, 14, 275–293. [CrossRef]

74. Fennell, D.A.; Weaver, D.B. Vacation farms and ecotourism in Saskatchewan, Canada. *J. Rural. Stud.* 1997, 13, 467–475. [CrossRef]

75. Lu, B. Eco-value and Practice in Ecology. *Socialist 2013, 13, 20–23.*

76. Nation, U. Global Assessment Reports. 2005. Available online: https://www.docin.com/p-724721856.html. (accessed on 18 December 2021).

77. Donhauser, J. Making ecological values make sense: Toward more operationalizable ecological legislation. *Ethics Environ.* 2016, 21, 1–25. [CrossRef]

78. Liu, J. Viewing the structure relationship among ecotourism stakeholders from the perspective of Systematology. *Tour. Trib.* 2010, 5, 19–23.

79. Devani, K.; Quinton, C.D.; Archer, J.A.; Santos, B.F.; Martin-Collado, D.; Amer, P.; Pajor, E.A.; Orsel, K.; Crowley, J.J. Estimation of economic value for efficiency and animal health and welfare traits, teat and udder structure, in Canadian Angus cattle. *J. Anim. Breed. Genet.* 2021, 138, 314–325. [CrossRef]

80. Woldeyohannes, A.; Cotter, M.; Biru, W.D.; Kelboro, G. Assessing changes in ecosystem service values over 1985–2050 in response to land use and land cover dynamics in Abaya-Chamo Basin, Southern Ethiopia. *Land 2020, 9, 37.* [CrossRef]

81. Joppa, L.N.; Loarie, S.R.; Pimm, S.L. On the protection of “protected areas”. *Proc. Natl. Acad. Sci. USA 2008, 105, 6673–6678. [CrossRef]

82. Bai, Y.; Ochuodho, T.O.; Yang, J. Impact of land use and climate change on water-related ecosystem services in Kentucky, USA. *Ecol. Indic.* 2019, 102, 51–64. [CrossRef]

83. Barco, A.; Borin, M. Treatment performances of floating wetlands: A decade of studies in North Italy. *Ecol. Eng.* 2020, 158, 106016. [CrossRef]

84. McCool, S.F. Constructing partnerships for protected area tourism planning in an era of change and messiness. *J. Sustain. Tour.* 2009, 17, 133–148. [CrossRef]
Sustainability 2022, 14, 10151

85. Jamal, T.; Stronza, A. Collaboration theory and tourism practice in protected areas: Stakeholders, structuring and sustainability. *J. Sustain. Tour.* 2009, 17, 169–189. [CrossRef]

86. Ali, Q.; Yaseen, M.R.; Anwar, S.; Makhdum, M.S.A.; Khan, M.T.I. The impact of tourism, renewable energy, and economic growth on ecological footprint and natural resources: A panel data analysis. *Resour. Policy* 2021, 17, 77–97. [CrossRef]

87. Zang, Z.; Zou, X.; Zuo, P.; Song, Q.; Wang, C.; Wang, J. Impact of landscape patterns on ecological vulnerability and ecosystem service values: An empirical analysis of Yancheng Nature Reserve in China. *Ecol. Indic.* 2017, 72, 142–152. [CrossRef]

88. Dyck, B.; Silvestre, B.S. Enhancing socio-ecological value creation through sustainable innovation 2.0: Moving away from maximizing financial value capture. *J. Clean. Prod.* 2018, 171, 1593–1604. [CrossRef]

89. Hoffman, A.J.; Badiane, K.K.; Haigh, N. Hybrid organizations as agents of positive social change: Bridging the for-profit and non-profit divide. In *Using a Positive Lens to Explore Social Change and Organizations*; Routledge: London, UK, 2012; pp. 152–174.

90. Ramkissoon, H.; Smith, L.D.G.; Weiler, B. Relationships between place attachment, place satisfaction and pro-environmental environmentalism. *Hum. Ecol. Rev.* 1999, 6, 81–97. [CrossRef]

91. Cheng, T.M.; C. Wu, H.; Huang, L.M. The influence of place attachment on the relationship between destination attractiveness and environmentally responsible behavior for island tourism in Penghu, Taiwan. *J. Sustain. Tour.* 2013, 21, 1166–1187. [CrossRef]

92. Ramkissoon, H.; Smith, L.D.G.; Weiler, B. Relationships between place attachment, place satisfaction and pro-environmental behaviour in an Australian national park. *J. Sustain. Tour.* 2013, 21, 434–457. [CrossRef]

93. Hughes, K.; Packer, J.; Ballantyne, R. Using post-visit action resources to support family conservation learning following a wildlife tourism experience. *Environ. Educ. Res.* 2011, 17, 307–328. [CrossRef]

94. Wu, J. A Study on the Inefficiency Mechanism of Tourists’ Pro-Environment Behavior in Different Spatio-Temporal Contexts: From the Perspective of Deindividuation. Ph.D. Thesis, Sun-yat sen University, Guangzhou, China, 2017.

95. Ngo, L.V.; O’Cass, A. Creating value offerings via operant resource-based capabilities. *Ind. Mark. Manag.* 2009, 38, 45–59. [CrossRef]

96. Xie, L.; Zhang, W.; Liu, J. Scale Development and Test of E-Travel Service Providers’ Customer Need Knowledge. *Tour. Sci.* 2015, 29, 14–34.

97. Hoopes, D.G.; Postrel, S. Shared knowledge, “glitches”, and product development performance. *Strateg. Manag. J.* 1999, 20, 837–865. [CrossRef]

98. Maskell, P.; Malmberg, A. Localised learning and industrial competitiveness. *Camb. J. Econ.* 1999, 23, 167–185. [CrossRef]

99. Winters, J.; Winters, R.; Winters, S. The Mediating Effect of Organizational Learning on Competitive and Cooperative Behavior and Innovation Performance of Firms in Industrial Clusters. Master’s Thesis, Dongbei University of Finance and Economics, Dalian, China, 2012.
117. Spender, J. The geographies of strategic competence: Borrowing from social and educational psychology to sketch an activity and knowledge-based theory of the firm. In The Role of Technology, Strategy, Organization and Regions; Oxford University Press: New York, NY, USA, 1998; pp. 417–439.

118. Chen, Z.; Dubinsky, A.J. A conceptual model of perceived customer value in e-commerce: A preliminary investigation. Psychol. Mark. 2003, 20, 323–347. [CrossRef]

119. LeBlanc, G.; Nguyen, N. Cues used by customers evaluating corporate image in service firms: An empirical study in financial institutions. Int. J. Serv. Ind. Manag. 1996, 7, 44–56. [CrossRef]

120. Loureiro, S.M.C.; Kastenholz, E. Corporate reputation, satisfaction, delight, and loyalty towards rural lodging units in Portugal. Int. J. Hosp. Manag. 2011, 30, 575–583. [CrossRef]

121. Jackson, K.T. Building Reputational Capital: Strategies for Integrity and Fair Play that Improve the Bottom Line; Oxford University Press: Oxford, UK, 2004; pp. 86–98.

122. Christou, E. Tourist destinations as brands: The impact of destination image and reputation on visitor loyalty. In Productivity in Tourism: Fundamentals and Concepts for Achieving Growth and Competitiveness; Keller, P., Bieger, T., Eds.; Erich Schmidt Verlag: Berlin, Germany, 2007.

123. Artigas, E.M.; Vilches-Montero, S.; Yrigoyen, C.C. Antecedents of tourism destination reputation: The mediating role of familiarity. J. Retail. Consum. Serv. 2015, 26, 147–152. [CrossRef]

124. Hall, R. The strategic analysis of intangible resources. J. Retail. Consum. Serv. 1992, 13, 135–144. [CrossRef]

125. Roberts, P.W.; Dowling, G.R. Corporate reputation and sustained superior financial performance. Strateg. Manag. J. 2002, 23, 1077–1093. [CrossRef]

126. Ferguson, T.D.; Deephouse, D.L.; Ferguson, W.L. Do strategic groups differ in reputation? Strateg. Manag. J. 2000, 21, 1195–1214. [CrossRef]

127. Du, J.; Xiong, S.; Yang, D. An empirical analysis of the impact of shared resources on enterprise competitive advantage in logistics cluster. Stat. Decis. 2015, 24, 196–199.

128. Clark-Carter, D. Doing Quantitative Psychological Research: From Design to Report; Psychology Press/Erlbaum (UK) Taylor & Francis: Hove, UK, 1997.

129. Byrne, B.M. Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming; Routledge Taylor & Francis Group: London, UK, 2010.

130. Tull, D.S. Marketing Research: Measurement and Method, 6th ed.; Macmillan Publisher: New York, NY, USA, 1993.

131. Anderson, J.C.; Gerbing, D.W. Structural equation modeling in practice: A review and recommended two-step approach. Psychol. Bull. 1988, 103, 411. [CrossRef]

132. Bjørnskov, C. How does social trust affect economic growth? South. Econ. J. 2012, 78, 1346–1368. [CrossRef]

133. Lusch, R.F.; Brown, J.R. Interdependency, contracting, and relational behavior in marketing channels. J. Mark. 1996, 60, 19–38. [CrossRef]