Understanding perception of Chinese geopark visitors in Hong Kong, Taiwan and Mainland China

by

GOU, Rui Gloria

A Thesis Submitted to

The Education University of Hong Kong

in Partial Fulfillment of the Requirement for

the Degree of Doctor of Philosophy

May 2020

ProQuest Number: 28153728

ProQuest 28153728

Published by ProQuest LLC (2020). Copyright of the Dissertation is held by the Author.

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

Statement of Originality

I, GOU, Rui Gloria, hereby declare that I am the sole author of the thesis and the material presented in this thesis is my original work except those indicated in the acknowledgement. I further declare that I have followed the University's policies and regulations on Academic Honesty, Copyright and Plagiarism in writing the thesis and no material in this thesis has been submitted for a degree in this or other universities.

Abstract

Geoparks are setup to ensure the conservation and rational use of geological resources for scientific, educational and economical purposes. After the UNESCO Global Geopark Network has been establishment in 2004, the number of Geopark and its visitors have increased rapidly in China. The increasing visitorship has not only enhanced economic development in Chinese rural areas where geoparks are usually located, but also lead to degradation of geological resources and landscapes. This study investigated the driving factors of geologically responsible behaviour of geopark visitors in Chinese geopark. 897 valid questionnaire surveys were collected in geoparks in Hong Kong, Taiwan and mainland China. The survey instrument gauged geologically responsible behaviour, environmentally responsible attitude, place attachment, visitor satisfaction, socio-economic information and willingness-to-pay. Results suggested that 1) Chinese Geopark visitors are characterized by a relatively young age, with higher education attainment and income, which is similar to the profiles of ecotourists, responsible tourists and wildlife watching enthusiasts; 2) significant inter-site differences were observed for geologically responsible behaviour, environmentally responsible attitude, and visitor satisfaction; 3) the average amount of Chinese geopark visitors' willingness-to-pay (WTP) was US$6.41; 4) WTP amount was associated only with gender and occupation of geopark visitors; 5) people with better environmentally responsible attitude are more support environmentally responsible actions, including offering financial support for conservation; 6) place attachment, visitor satisfaction, and environmentally responsible attitude played an influential role to geologically responsible behavior. The results of this study contribute to help improve visitor management policies and strategies of geoparks in the region; and the profile of geopark visitors of the Greater China Region acts as a reference for tourism company to develop future geo-tourism products. In particular, on top of asking visitors the obey park rules,

the provision of a more in-depth experience to visits can further enhance visitor's geologically responsible behaviour indirectly.

Keywords: geopark conservation; geologically responsible behavior; environmentally responsible attitude; place attachment; visitor satisfaction

Acknowledgments

The past four years of PhD study have been a great challenge to my intelligence, willpower and concentration. The expansion and deepening of knowledge is accompanied with the constant self-denial. Without the support of my supervisors, friends and family, I could not complete this lonely journey. Foremost, my deepest gratitude goes to Dr. FOK Lincoln, my principal supervisor, for his constant encouragement and guidance throughout the development of the thesis. Second, I would like to express my heartfelt gratitude to Dr. CHEUNG Ting On Lewis, my associate supervisor. Without his illuminating instruction and useful comments, this thesis could not have reached the present form. Thirdly, I am greatly indebted to Professor LEE Chi Kin, my associate supervisor. From him, I saw an elder scholar's enthusiasm and pursuit of academic research, optimistic and open-minded attitude towards life, care and patience for students.

Furthermore, I also want to thank all the teachers who have taught me in the past: Dr. WONG Fook-yee, Ms. YANG Chieh Yun, Dr. IP Kuai Peng and Mr. ZHANG Heping, etc. Grateful for encountering with them, make me, a girl born in rural China, be a beneficiary of education and believe in the power of education, which led my dream to be one of them, standing on the teaching platform to enlighten and warm the minds.

Finally, I would like to express my hearty thanks to my family and friends for their understanding, support and tolerance throughout the past few years.

Table of Contents

List of Abbreviations

GRB	Geologically responsible behaviour
ERB	Environmentally responsible behaviour
ERA	Environmentally responsible attitude
PA	Place attachment
VS	Visitor satisfaction
SEM	Structural Equation Model
U.N.	United States
UNESCO	United Nations Educational, Scientific and Cultural Organization
GGN	Global Geopark Network
NGNC	National Geopark Network of China
M.N.R	Ministry of Natural Resources of the People's Republic of China (Former Ministry of Land and Resources of the People's Republic of China)
AFCD	Agriculture, Fisheries and Conservation Department (Hong Kong)

List of Figures

List of Tables

Chapter 1: Introduction

With the rapid expansion of the Global Geoparks Network since 2004, the value of geological resources has recently received more emphasis among the public. Rich and varied geological features are gaining in popularity with tourists worldwide, especially in China. As announced at the China UNESCO Global Geopark Annual Meeting, the annual number of tourist arrivals at national geoparks in China exceeds 500 million (Fu, 2019), and visiting geoparks is an emerging niche of nature-based tourism in China. Meanwhile, geopark systems have also expand rapidly. Since 2004, the number of global geoparks in China has been grown to 39, accounting for more than 1/4 of the total number of 147 global geoparks worldwide (Global Geopark Network, 2020). In addition, 220 national geoparks have been designated by the Chinese government (National geopark network center, 2020). However, the increasing numbers of geoparks and visitors have not only generated tourism revenue but also placed environmental stress on invaluable geological resources and natural landscapes. Increasing numbers of observed conflicts have appeared in geoparks in China and overseas due to the improper behaviours of tourists. Therefore, this research studies Chinese geopark visitors in Hong Kong, Taiwan and mainland China, allowing a better understanding of the environmentally responsible behaviours of Chinese geopark visitors to formulate appropriate strategies for geopark management and conservation.

1.1 Research background

After 4.6 billion years of planetary geological evolution, a large number of precious geological fingerprints have been left on the Earth's surface, recording a considerable amount of natural information, particularly on the Earth's paleogeography, paleoclimate, paleontology and paleostructure. Therefore, for human beings, protecting geological sites is vital. At present, however, many geosites of high scientific value face degradation. Therefore, geologists and UNESCO proposed the Global Geopark Network Project at the global level to protect and develop geosites to achieve geological conservation and education and to facilitate rural economic development. Since the establishment of this geopark network, geoparks have been designated and have attracted an increasing number of tourists. However, misbehaving tourists have often exerted adverse impacts on the geological resources within the parks. Hammitt, Cole, and Monz (1998) pointed out that tourism development and tourist activities may have serious or even irreversible impacts on vegetation, soil, water and wildlife resources. Therefore, striking a balance between tourism development and geoconservation is an important topic for scholarly research and geopark operation.

However, the traditional method of tourism management mainly focuses on the management of tourism resources themselves and does not pay enough attention to the human factors in the management process. It often ignores the important role played by tourists (Hall & McArthur, 1997), and as a result, more manpower and resources are spent to maintain cleanliness and to train staff to deal with visitors' improper environmental behaviours. If tourists voluntarily engage in environmentally responsible behaviour, it can help management lower costs and promote the sustainable use of tourism resources (Imran, Alam, & Beaumont, 2014; Lee, Jan, & Yang, 2013).

In the past, there were two main approaches to promoting a balance between environmental conservation and economic benefits: 1) generating tourism revenue that could be fed back into environmental conservation and 2) protecting the environment through strict management regulations, such as setting restrictions on the number of tourists and controlling tourists' behaviour. Although these two approaches are basically effective at tourism destinations, they cannot fundamentally alleviate the contradiction between tourism development and environmental conservation. For instance, Zhangjiajie Sandstone Peak Forest Geopark received warnings from UNESCO (1998 & 2013), which commented that "it is now with an abundance of tourist facilities, like a botanical garden or city park" and it is "performing badly in popularizing earth knowledge to the public". Even in the case of world-class nature reserves, tourism destinations are easily driven by economic incentives. To meet increasing tourism demand that can yield income, tourism products and projects sometimes contradict the principles of environmental conservation, resulting in irreversible damage to the ecological environment (Liu et al., 2008; Krider et al., 2010). As a counter-example, Wolong National Nature Reserve has always put the protection of giant pandas and their habitats first, even sacrificing the development rights of local residents. Local residents rely entirely on national subsidies, and almost all economic activities are prohibited in the protected area. Therefore, there has always been a conflict between tourism development and environmental conservation (Dolnicar & Long, 2009; Moeller et al., 2011).

Both of the above approaches make a default assumption: Tourists are naturally negative assets for environmental conservation, and tourists entering scenic spots will inevitably cause damage to the natural environment (Weaver & Lawton, 2011). Under this assumption, tourism destinations can only deal with the contradiction between tourism development and environmental conservation through regulations, restrictions or feedback mechanisms.

But in recent years, some research results in social psychology, environmental psychology, leisure behaviour and other fields have questioned this default assumption (Ataljevic & Doorne, 2000; Fairweather et al., 2005; Dolnicar & Matus, 2008; Lee & Moscardo, 2005; Hou et al., 2005; Vaske & Kobrin, 2001). These studies suggest that there is a group of tourists with a "pro-environmental" behavioural tendency that drives them in their leisure and tourism activities to show a behavioural tendency to cherish nature and promote environmental conservation (Ataljevic & Doorne, 2000; Fairweather et al., 2005). Tourists with pro-environmental attitude have higher willingness-to-pay to the ecotourism products (Fairweather et al., 2005). They are willing to pay higher tourism costs for unspoiled natural scenic spots and are even willing to actively promote the conservation of tourism destinations through donations and volunteer activities (Dolnicar & Matus, 2008). In addition, well-designed and planned sustainable tourism destinations equipped with environmentally friendly facilities, activities and interpretative systems can guide tourists and affect their environmentally responsible attitude and behaviour (Lee & Moscardo, 2005; Hou et al., 2005; Vaske & Kobrin, 2001). The above research findings have prompted tourism researchers and management authorities to redefine the role of tourists and their environmental behaviours in conservation. This is prompting researches to investigate visitors' environmentally responsible behaviour and its influencing factors.

This study holds the definition of environmentally responsible behaviour to a series of behaviours that reduce the consumption or promote sustainable utilization of natural resources (Ramkission et al., 2012; Lee et al., 2013). The conflict between tourist behaviour and environmental conservation should be re-conceptualized, as many current studies have identified that ecotourists' behaviours cause limited negative impacts on natural environment, and even can contribute to the promotion of environmental conservation. Therefore, if tourists can be stimulated and cultivated to behave properly, they will no longer be regarded as negative assets and, instead, can play a part in promoting the conservation of nature-based destinations. Cultivating visitors' environmentally responsible behaviour is therefore the best strategy to resolve the dilemma of environmental conservation and tourism development to achieve the sustainable development of destinations (Kafyri et al., 2012; Alessa et al., 2013)

Recently, western researchers have gradually applied this concept to the tourism context to explore the driving mechanisms of visitors' environmentally responsible behaviours. As a result of the Western dominance in this field, work in the Asian context, especially the Chinese context, is lacking. However, limited studies have been conducted on geo-conservation. Therefore, research on environmentally responsible behaviour is needed to further strengthen the application of this concept to geo-conservation and the Chinese context.

1.2 Research objectives and research questions

Most scholars tend to identify the controlling factors influencing visitors' environmentally responsible behaviour. For example, some researchers have pointed out that socioeconomic variables like age, gender, educational background, income, and occupation are influencing factors for environmentally responsible behaviours (Hedlund et al., 2012; Chiu et al., 2014). Other researchers explored the intrinsic factors that affect visitors' willingness to adopt environmentally responsible behaviour, which have highlighted environmental knowledge, environmental awareness, environmentally responsible attitude, tourism motivation, etc. (Perkins & Brown, 2012; Lee, 2009).

To uncover how the environmentally responsible behaviours of visitors can be predictable and cultivated, this study will explore the influencing factors on visitors' environmentally responsible behaviour. In this study, different variables, including demographic characteristics, place attachment, environmentally responsible attitude and visitor satisfaction, will be examined. The research question is: "What are the characteristics of Chinese geopark visitors, and will place attachment, visitor satisfaction and environmentally responsible attitude affect their geologically responsible behaviour?" Specifically, the objectives are listed below:

1) To explore the demographic characteristics of Chinese visitors at geoparks;
2) To compare the demographic characteristics of Chinese geopark visitors in Hong Kong, Taiwan and mainland China geopark with their similarities and differences;

3) To explore the relevant variables that are affected by demographic characteristics;
4) To calculate the willingness-to-pay of Chinese geopark visitors in Hong Kong, Taiwan and mainland China and to explore the association with their environmentally responsible behaviour;
5) To explore the associations between environmentally responsible behaviour, place attachment, environmentally responsible attitude and visitor satisfaction.

1.3 Significance of the research

This study is significant for both theory and practice. The theoretical significance of this study mainly lies in its theoretical application, theoretical revision and interdisciplinary theoretical integration, which can be shown in four ways: 1) Few studies of visitors' environmentally responsible behaviour have been conducted in the Greater China Region; in particular, few studies have discussed the tourism context in depth. 2) This study uses the theoretical framework of Attitude-Behaviour-Context (ABC) theory to explore the driving factors of visitors' environmentally responsible behaviour, deepening the theoretical basis of this field of research and holding a certain significance for promoting theoretical research on visitors' environmentally responsible behaviour. 3) This paper incorporates place attachment into research on visitors' environmentally responsible behaviour, testing the influence of the level of human-land interaction on visitors' willingness to implement environmentally responsible behaviours and compensating for the limitations of previous related studies. 4) This study adopts structural equation model to model the relationships among environmentally responsible behaviour, place attachment, visitor satisfaction and environmentally responsible attitude

In practice, this study focuses on the practical problem of how to cultivate and stimulate visitors' spontaneous environmentally responsible behaviour, as well as its driving factors. This has certain practical significance for promoting the concept and practice of sustainable development in the geo-tourism industry. Second, it provides new development ideas for the sustainable development of geo-tourism. 1) This study can help authorities formulate appropriate management policies and strategies; 2) The profile of geopark visitors in the Greater China Region can serve as a reference for tourism companies for the development and marketing of geo-tourism products. 3) Its valuation of the willingness-to-pay of Chinese geopark visitors may inspire local communities to engage in sustainable geo-tourism.

1.4 Organization of the study

First, this study had combed the relevant literature of geoparks and geo-tourism, place attachment, visitor satisfaction, environmentally responsible attitude and environmentally responsible behaviours, both on domestic and western literature. Then, it proposes relevant hypotheses and establishes theoretical models. Finally, taking the Hong Kong Geopark, Taiwan's Yehliu Geopark and Guangdong's Danxiashan Geopark as study areas, a questionnaire survey has been conducted. The thesis is organized as follows:

The full text is divided into 7 chapters. First of all, chapter 1 introduced the research background, research purpose, research ideas and significance. The second chapter is the literature review, which includes the related concepts (such as geoparks, geo-tourism, place attachment, environmentally responsible attitude, visitor satisfaction and environmentally responsible behaviour) and the research status of environmental behaviour and research methods (i.e., this part defines the research variables, designs the questionnaires, measures the variables, constructs conceptual models, proposes hypotheses, and explains the research process, sample selection and selection of statistical methods). The third chapter introduces the research sites: The Hong Kong Geopark, Taiwan's Yehliu Geopark and Guangdong's Danxiashan Geopark. The fourth and sixth parts consist of statistical analyses and discussions, which are divided into three research directions. Statistical analysis is carried out on the data obtained from the questionnaire, including a description of the sample profile, descriptive statistical analysis, validity and reliability analysis of the sample scale; the research hypothesizes were modified on the basis of the attitude-behaviour-context theory. Correlation analysis, regression analysis, variance analysis and structural equation modelling were carried out on visitors' socio-economic characteristics, place attachment, visitor satisfaction, environmentally responsible attitude and behaviours to verify the hypothesis. The fourth chapter presents a descriptive analysis of visitors' socio-economic characteristics and other factors and compares the similarities and differences in visitors at the three geoparks on both sides of the Taiwan Strait. The fifth part conducts correlation analysis between willingness-to-pay and other related factors. The sixth chapter performs structural equation modelling. The seventh chapter concludes and summarizes the main conclusions of the study, its limitations, and prospects for further research.

Chapter 2: Literature Review

Chapter 2 illuminates a detailed background of the development of geoparks and geo-tourism and then summarizes the theoretical foundations of environmentally responsible behaviours. Previous studies on environmentally responsible behaviours, particularly in the field of environmental studies (Cheung & Fok, 2013; Hines, Hungerford, & Tomera, 1987; Kaiser, Wolfing, & Fuhrer, 1999; Kentucky Environmental Education Council, 2009; Kilbourne & Pickett, 2008; Lee et al., 2013), are reviewed in the tourism context. Place attachment is one prominent construct considered in this study. A comprehensive review on place attachment concept will follow. Through this literature review section, identified research gaps will form the basis of the current research.

2.1 Geoparks and geo-tourism

Geological features and landscapes are traces left on the Earth's surface by the process of the Earth's evolution and serve as physical archives by which human beings can understand Earth's long-term processes, including sea-level changes, mountain uplift, rock weathering and cave formation (Zouros & McKeever, 2009). Such features can also be used to understand rapid and violent geological phenomena such as earthquakes, volcanic eruptions, and tsunamis. Special geological relics, such as glaciers, can help human beings obtain the records of environmental and climate changes—which used to make future predictions (Farsani, Coelho, & Costa, 2011). Fossils are valuable in helping us understand the origin, development and evolution of life and the history of human origin, migration and evolution (Wang, Tian, & Wang, 2015). Therefore, conservation of geological features is of immeasurable significance to human survival and sustainable development. But unfortunately, the expansion of human activities have continuously degraded these geological records (Wang et al., 2015).

In the past, a large number of geological features were protected through the establishment of national and regional protected areas or other international protection plans, such as World Heritage sites. However, World Heritage emphasizes the authenticity, integrity and protection of the place values and attributes (UNESCO, 2006). Therefore, geologists and UNESCO have advocated protecting the physical landscape, which includes geological relics that emphasize geological heritage along with geological, biological, and cultural heritage interrelationships that are integrated with social-economic development (Patzak & Eder, 1998). Currently, a large number of important geological relics are under threat. The establishment of geoparks has been proposed as a new tool to conserve these geological features, educate the public on the importance of these geological resources, and bring economic development to rural areas (Cheung, 2016; Ólafsdóttir & Tverijonaite, 2018).

2.1.1 Geopark

In 1996, the United Nations Educational, Scientific and Cultural Organization (UNESCO) (Division of Earth Science) and the International Union of Geological Sciences (IUGS) jointly proposed to establish a global geopark network (GGN) to strengthen geological conservation and create employment to promote regional economic development (The 30th

International Geological Congress, 1996) (UNESCO, 2006; Zouros & McKeever, 2009). To achieve this goal, UNESCO formally introduced the geopark concept and a new accreditation system called the “UNESCO Global Geopark” (UNESCO, 1999). The UNESCO Global Geopark is an important complement to the World Natural Heritage and Cultural Heritage. Global geoparks have the same legal status as "World Heritage". Thus, the concept represents an expansion of the “World Heritage Convention” and “Man and the Biosphere Programme”. As of 2020, 141 global geoparks have been recognized in 41 counties (UNESCO, 2020).

The UNESCO definition of a geopark is *“A nationally protected area containing a number of geological heritage sites of particular importance, rarity, or aesthetic appeal, managed with a holistic concept of protection, education and sustainable development”(GGN, 2010).* Scholars have defined a geopark as “… a unified area that advances the conservation and use of geological heritage in a sustainable way and promotes the economic well-being of the people who live there” (Zouros & McKeever, 2009). Both of these definitions emphasize that geoparks are an approach for integrating conservation and sustainable development with special emphasis on local communities (Du & Girault, 2018; P & Zouros, 2005; Patzak & Eder, 1998). A geopark not only includes geological features but also other natural, ecological and cultural landscapes within its area or in nearby areas (Dowling, 2013), as well as various facilities to serve tourists, including public education, reception facilities and infrastructure (Farsani, Coelho, & Costa, 2010). The establishment of geoparks requires cooperation not only among geologists but also tourism experts, ecologists, planners and engineers.

Geopark has been first originated from nature parks that has the dual functions of protecting nature and providing leisure opportunities, such as Yellowstone National Park in the United States. Meanwhile, the geopark also functions as a museum with two major functions: protecting natural resources and improving citizens' scientific literacy. In addition, under the background of sustainable tourism development theory (U.N., 2007), geoparks also focus on local community development. In summary, a geopark undertakes three tasks: 1) protecting geology; 2) popularizing earth science knowledge; and 3) promoting sustainable development of the local economy and society.

Before declaring any national or global geopark, a comprehensive professional assessment focusing on geological relics is required. In addition, the planning and design of a geopark should include land use planning for geological conservation, popular science education, visitor management, infrastructure layout, land use security, investment estimates, and park construction and management.

Geoparks cover a wide range of disciplines and factors. The focus of this research is to ensure geological heritage protection and environmentally responsible behaviour by geopark visitors, which is paramount to the conserving the former. This study provides a basis for formulating visitor management strategies to achieve geological heritage protection.

<u>Geosite</u>

Geosites are the foundation for the establishment of a geopark because they offer the tourism resources required for geo-tourism development (Chen, Lu, & Ng, 2015; Dowling & Newsome, 2006; Hose, 2011). After decades of development, the concept of a geosite has gradually become clear. A geosite is a precious and non-renewable geological heritage that has formed, developed and survived various internal and external forces during Earth's long geological history (M.N.R., 2010).

There is currently no unified classification of geosites. UNESCO's guideline to the work of the Global Geopark Network classified geosites into earth history, geomorphology, stratigraphy, structural geology and volcanology, glacier geology, hydrogeology, minerals, paleontology, petrography, sedimentology, economic geology and mining, and engineering geology and soil science (GGN, 2010). Based on the type of scenic spot, the geological heritage working group of the International Federation of Geosciences classified geological heritage into 13 categories and several subcategories, including paleontology, geomorphology, paleoenvironment, rocks, strata, minerals, structures, economic geology and seabed geomorphology. The Technical Requirements for the Planning and Compilation of National Geoparks issued by the Ministry of Land and Resources of China proposed a geosite classification that is mainly divided into 7 major groups with 25 categories and 56 subcategories, including geological (body and layer) profiles, geological structures, paleontology, minerals and deposits, geomorphological landscape, water landscapes, and environmental landscapes, arranged according to their genesis and landscape types

(M.N.R., 2010). In May 2017, the Ministry of Land and Resources officially issued the "Geosites Survey Standard", which classifies geosites into 3 major groups with 13 categories and 46 subcategories. The three major groups are basic geology, geomorphic landscape and geological disasters. Newsome, Dowling, and Moore (2005) classified tourism from a tourist perspective; the main categories include landscape, landform, sediment/deposit, rock and fossil, covering volcanic, glacier, karst, coastal, aeolian/wind erosion, fluvial landforms, rocky outcrops, and sedimentary environments, including weathered layers, minerals and other elements.

Geological landscape

To improve the accuracy of description, geo-tourism experts call geosite an attraction of geological landscape. In this sense, a geological landscape refers to landforms at different scales and with different exposed shapes on the Earth's surface (including caves) (Kim, Kim, Park, & Guo, 2008). These geological landscapes are important resources for geo-tourism.

2.1.2 Geo-tourism

Geo-tourism has become a new tourism niche since it was first proposed in the 1990s and forms an emerging niche market of sustainable tourism (Dowling & Newsome, 2010; Farsani et al., 2011; Stoffelen & Vanneste, 2015). At present, no unified and concrete worldwide concept of geo-tourism exists; scholars from various countries have different interpretations of geo-tourism. Hose (1995) first studied modern geo-tourism and defined it as “geo-tourism adopts geosites, geomorphic landscapes and related artefacts as attractions and uses corresponding appropriate equipment and service facilities to allow the public to view geological landscapes and acquire geological knowledge, to achieve the purpose of protecting geosites” (Hose, 2000, 2011). Some scholars have also strictly defined geo-tourism as "a form of tourism that pays special attention to geology and landscapes"(Newsome, Moore, & Dowling, 2012). Joyce (2010)and Robinson (2008) both believe that geo-tourism is ecotourism, while Newsome et al. (2005) believe that geo-tourism and ecotourism are different. Hose (2008) summarized geo-tourism as an ecotourism and sustainable tourism that enables people to gain knowledge of geology, geography and other related disciplines by visiting and investigating a series of geological heritage sites and geological features (geographical features and landscape) (Cheung, Fok, & Fang, 2014; Hose, 2011; Ng, 2007). Although the above viewpoints are different, they generally indicate that geo-tourism is tourism activity aimed at both sightseeing and at understanding geological landscapes that have scientific research value. This study adopted the definition from Newsome & Dowling (Dowling & Newsome, 2010), which is that geo-tourism “a form of natural area tourism that specifically focuses on geology and landscapes. It promotes tourism of geosites, the conservation of geodiversity, and an understanding of earth sciences through appreciation and learning” (Dowling & Newsome, 2010).

2.1.3 Geopark development in Hong Kong, Taiwan and Mainland China

The Development of Hong Kong Global Geopark

Hong Kong Geopark has been established in 2008 and recognized as Chinese National Geopark in 2009. It successfully joined Global Geopark Network in 2011 and changed its name from Hong Kong National Geopark to Hong Kong Global Geopark of China. In 2015, its name was officially updated to Hong Kong UNESCO Global Geopark (Cheung, 2016).

Before Hong Kong Geopark was established, most of the current geosites were covered by existing country park and marine park systems that were regulated by the Marine Parks Ordinance and Country Parks Ordinance, managed by the Agricultural, Fisheries and Conservation Department (AFCD) (Cheung, 2016). The park aims to promote conservation, education and sustainable development and focuses on conserving the geological resources and landscape, promoting community participation, promoting scientific popularization and geo-tourism (Ng, 2007).

To enhance the visitor experience, geopark guide systems have been developed (Cheung, 2016). There are two geopark guide accreditation systems in Hong Kong: The Recommended Geopark Guide System (R2G) operated by the Association for Geo-conservation (AGHK) and the Accredited Geopark Guide System (A2G) operate by the Travel Industry Council (TIC). A2G is a more advanced certification system for geopark guides, and eligibility is restricted to applicants who have already become R2G guides, have completed at least 80 hours of geopark guide experience, and hold a first-aid certificate. An A2G has to complete 15 hours of relevant training and pass the on-site assessment and practical examination to be fully accredited. To maintain an accredited status, the A2G must be re-assessed every three years.

R2Gs was established in accordance with the rules of the Global Geopark Network and references The International Ecotourism Society and Ecotourism Australia (AGHK, 2010), whose goal is to ensure that geo-tourism guides have appropriate knowledge and interpretation skills, which allow them to effectively share accurate geological information to geopark visitors. A 60-hour training course is a mandatory requirement for applicants. After 6 months of probation, applicants can be formally accredited as an R2G. According to the R2G website, there are 4 A2G guides and 42 R2G guides registered under the systems (R2Gs, 2019). The service fee for R2G refers to HKD800-1000 for guided geo-tours in HKUGG.

Apart from the geo-tour guide system, there are two visitor centres in HKUGG, named the Geopark Visitor Centre and the Sai Kung Volcano Discovery Centre. The Hong Kong Global Geopark Visitor Centre is supported by The LIONS Nature Education Foundation. It introduces the geological history of Hong Kong and presents the formation of major geological heritage sites and the Global Geoparks Network. Three themed exhibits are perennially located in the centre: rocks, fossils and local cultural heritages. There is one Rock Classroom in the Geopark Visitor Centre, designed primarily to facilitate lectures and interactive games for primary and secondary school students learning earth sciences. The

Volcano Discovery Centre located in downtown Sai Kung is responsible for explaining how the landscape has been shaped by ancient volcanoes and for providing introductory knowledge of volcanoes.

In addition, there are 4 geoheritage centres in different districts, established by NGOs, local villages and government; these are named the Tai Po Geoheritage Centre, Kat O Geoheritage Centre, Lai Chi Wo Geoheritage Centre, and the Ap Chau Story Room. All the centres provide information on local history and culture, the diverse natural environment and geological knowledge.

Development of Geoparks in Taiwan

As of May 2016, Taiwan has a total of 9 geopark network members: Penghu Marine Geopark, North Coast Yehliu geopark, North Coast Bitou Longdong Geopark, Caoling Geopark, Yanchao Mudstone Geopark, Liji Mudstone Geopark, Mazu Geopark, Yunjianan Coastal Geopark and East Coast Geopark (Lin & Su, 2019). Geopark promotion is mainly conducted by the conservation group of the Forestry Bureau of the Agricultural Committee, which holds 2 geopark network meetings every year where stakeholders can share their management experience and scientific knowledge. Such communication between stakeholders may enhance stakeholders' geological knowledge, allowing them generate insights for geopark conservation and tourism management to ensure the sustainable development.

As Taiwan is not the member of the United Nations, it is difficult for Taiwan's geopark to be designated a UNESCO global geopark. Therefore, Taiwan can only participate in the Asia-Pacific Geoparks Network to communicate with and promote geoparks around the world. The research site selected in this thesis, Yehliu Geopark, is the first park in Taiwan to adopt the concept of a UNESCO Geopark as its transformation and management objective (Yiling & Junquan, 2010). It is located in the coastal area of the north-eastern part of Taiwan. The coastal terrain of Yehliu was developed and belongs to an eroding, receding coast. The terrain is mainly a single-sided mountain sloping to the southeast that incorporates sea cliffs and sea erosion platforms. It is an excellent outdoor teaching venue for primary and secondary school students, and it is also a recreation area with great potential as a nature-based tourism destination.

Similar to other geoparks around the world, Yehliu Geopark has recruited a group of volunteers to train to become geo-tour guides in the park. All these volunteers must attend training. The basic training courses last for a total of 12 hours and are intended to teach a basic curriculum consisting of Volunteer Service Law. The professional training involves teaching professional guide management methods in natural and human ecological landscape areas for 15 hours.

After the volunteers have been trained in the park, they are temporarily issued an internship certificate and must complete the 30 internship hours according to the regulations. After passing an assessment, they will be issued a training certificate and a volunteer service certificate, which are recorded after the report is submitted to the North View Office. On the guided tours, volunteer interpreters serve groups by appointment. The volunteers provide interpretation services at various locations to impart geological knowledge to visitors.

The visitor centre of Yehliu Geopark provides information and services for visitors, including free travel information, information about the geopark exhibits, and DIY classrooms. The Visitor Centre has a multimedia screening room that plays the Yehliu Geopark film in four languages (Chinese, English, Japanese and Korean). Regarding environmental education, Yehliu Geopark cooperated with local communities to promote local environmental education activities by training young volunteers to record verbal histories from their elders and by offering summer camps and culture festivals. Thus, visitors can easily explore intricate cultural details and gain a more meaningful experience. Meanwhile, the geopark cultivates a hometown identity by training local children as curators and designing various classes and activities for children. These helps children gain a deeper understanding of their hometown.

Development of Geoparks in Mainland China

China covers a vast geographic area and has complex geographical conditions, various forms of geological structures and rich and colourful geological resources. It is also one of the few countries in the world that have multiple different types of geological features.

Geopark construction in China has started in 2000 under the leading of the Ministry of Land and Resources in response to UNESCO's initiative to establish a "Global Geopark Network System" and to implement the State Council's task of protecting geological resources. In addition, the National Geopark initiated by the Chinese government has become a world pioneer. In 2002, China formulated the "Guidelines for the Overall Planning of National Geoparks" and set up the National Geoheritage (Geoparks) Expert Evaluation Committee in the following year. The first batch of geoparks was established in 2000; later, several national geoparks and global geoparks were established in 2004. At the same time, local governments have also approved the establishment of several provincial geoparks.

By the end of 2015, with the approval of the Ministry of Land and Resources, 212 national geoparks were successfully established in China, 33 of which are global geoparks (GGN, 2020; NGNC, 2020). Through geopark construction, many precious geosites have been effectively protected and also simultaneously promoted the development of tourism and related industries and fostered development of the local economy, society and culture.

The Danxiashan Global Geopark has an independent tour guide management system. The training includes a 6-hour theoretical course and a 2–3-day field interpretation demonstration. A guide in the Danxiashan geopark must pass the assessment administered by the Danxiashan geopark authority. Professional volunteers with academic and official backgrounds can be arranged to provide interpretation for visitors. The Danxiashan global geopark organizes geological volunteer camps every year. It is a one-week camp that includes tens of selected volunteers who are experts or interested in geology, ecology, astronomy, botany, tourism planning and related fields. Most volunteers are undergraduate or postgraduate student. A small number of volunteers are geography and geological enthusiasts. This type of camp helps the Danxiashan Geopark prepare many professional geological interpreters to serve in the geopark.

Danxiashan is one of the first national science education bases to be named by the Ministry of Land and Resources. The Danxiashan Global Geopark has always attached great importance to science education to promote the Danxia landform. A geopark museum located in the visitor centre of the Danxiashan Global Geopark introduces the main features and formation of the Danxia landform, the Global Geopark Network, ecology and local culture. For primary and secondary schools, Danxiashan Geopark launched a 'Danxiashan book sale' that involved countrywide public welfare activity to donate books relating to Danxiashan. For colleges and universities, Danxiashan Geopark organizes lectures to promote the Danxia landform and earth science and foster awareness of geological heritage conservation.

2.2 Responsible geopark visitor behaviour

People today are facing various environmental problems, including the global warming, air pollution, lack of water resources, depletion of natural resources and biodiversity reduction. These problems are rooted in human behaviour (Gardner & Stern, 1996). Regarding tourism, improper behaviours such as littering, writing on cultural relics, picking flowers, climbing trees, trampling on vegetation (Buckley, 2004; Buckley, Zhong, & Ma, 2017; Cole, 2004; Cole & Spildie, 1998; Jim, 1987), disturbing wildlife habitats (Buckley, 2004; Cheng, Cheung, Chow, Fok, & Cheang, 2018; Cheung, Lo, & Fok, 2017; Cheung & Jim, 2006), and feeding animals (Giglio, Luiz, & Schiavetti, 2015; Steven, Morrison, & Castley, 2014) will directly or indirectly affect—or even destroy—the physical environments of tourist attractions. The continuous growth of tourist volume in scenic spots means that the frequency and intensity of leisure tourist activities are also increasing (L. T. Cheung & C. Jim, 2013; L. T. O. Cheung, 2013; Deng, Qiang, Walker, & Zhang, 2003; Garrod, Fyall, & Leask, 2006; Marion & Reid, 2007). These activities can have a substantial negative impact on tourist resources and scenic-spot tourist environments and will eventually affect the sustainable utilization of tourist resources and local tourism (Lee, 2011).

However, the traditional method for managing tourism resources focuses mainly on the management of tourism resources themselves; it does not pay sufficient attention to the human factors in the management process. For example, the traditional approach often ignores the important role played by tourists in managing tourism resources (Hall & McArthur, 1997). The result is that tourism resource management requires excessive manpower to maintain the cleanliness of the environment of the tourist sites and to train staff to deal with the negative impacts. If contrast, if tourists were to voluntarily engage in environmentally responsible behaviour, it would help scenic area management save considerable money and simultaneously help promote the sustainable use of tourism resources (Camp & Fraser, 2012; L. T. O. Cheung, 2013; Cheung & Jim, 2006; Fisher, Bashyal, & Bachman, 2012; Kronenberg, 2014). The tourism industry maintains a strong development momentum; thus, how to protect tourism resources and the tourism environment and how to ensure the sustainable utilization of tourism resources are problems that the tourism industry urgently needs to solve. Therefore, according to the guidelines of sustainable tourism development, environmentally responsible behaviour by tourists is a realistic problem worthy of attention in the tourism industry, and how to achieve the balance has become an important and urgent call.

The increasing number of tourists brings harmful effects on tourist attractions, scholars have begun to call on tourists to implement environmentally responsible behaviours in tourist attractions (Buckley, 2004; Cheung & Jim, 2006; Chow, Ma, Wong, Lam, & Cheung, 2019; Cole, 2004; Jim, 1987). The belief is that encouraging tourists to implement environmentally responsible behaviours is the most important means to reduce tourism's negative or harmful effects on the tourist environment (Lee, Jan, & Yang, 2013). The environmentally responsible behaviour of tourists in scenic spots helps to protect natural and cultural heritage resources in scenic spots and promote improvements to the environmental quality of scenic spots (Budeanu, 2007; Cheng et al., 2018; L. T. O. Cheung, 2013; Ma, Chow, Cheung, & Liu, 2018). Appropriate tourist behaviour contributes to the sustainable utilization of tourism resources and ultimately promotes local tourism (Ballantyne, Packer, & Everett, 2005; Packer, Ballantyne, & Hughes, 2014). Some scholars believe that to ensure sustainable tourism, it is necessary to cultivate visitors’ environmentally responsible behaviour during tourist and leisure activities (Chiu, Lee, & Chen, 2014; Ciuti et al., 2012; F.G. Kaiser et al., 1999; Ma et al., 2018; Marzano & Dandy, 2012). When visitors adopt environmentally responsible behaviours, they will practice the sustainable utilization of tourism resources (Barnes, Schier, & Rooy, 1997; Chiu et al., 2014; Cooper, Larson, Dayer, Stedman, & Decker, 2015; Gifford & Nilsson, 2014; Luo & Deng, 2008). Therefore, fostering environmentally responsible behaviour by tourists seems to be the best strategy for managing tourism destinations and scenic spots (Kafyri, Hovardas, & Poirazidis, 2012).

2.2.1 Environmentally responsible behaviour

Researchers use various words to describe environmentally responsible behaviour, including environmentally responsible behaviour, pro-environmental behaviour, environmentally friendly behaviour, low-impact behaviour, conservation behaviour, etc. (Hines et al., 1987; Kilbourne & Pickett, 2008; Kollmuss & Agyeman, 2002; Ma et al., 2018; Stern, 2000), among all these, the most common term is environmentally responsible behaviour. Different scholars have defined environmentally responsible behaviours. For example, Cottrell (2003) believes that environmentally responsible behaviour include any behaviours that protect environment and minimize the negative impact. Cottrell (2003) indicated that when individuals or groups are committed to doing the right thing in daily practice to help protect the environment, their behaviour can be termed environmentally responsible behaviour. Sivek and Hungerford (1990) believe that environmentally responsible behaviour refers to any behaviour by which individuals or groups help promote the sustainable use of natural resources, which can promote the conservation of tourism resources. Many researchers adopted Sivek and Hungerford (1990) definition of environmentally responsible behaviour, making it a definition of environmentally responsible behaviour widely cited by scholars. Tourism behaviour can either damage or protect a destination; therefore, several studies have been conducted to investigate what types of tourism behaviours can mitigate negative impacts (Lee et al., 2013; Lee & Moscardo, 2005; Vaske & Kobrin, 2001). Environmentally responsible behaviour (ERB) is associated with individual's environmental concern, knowledge and commitment and it contributes to avoiding, damage to the ecological environment (Chiu, 2014).

Scholars divide environmentally responsible behaviours into different categories. Stern (2000) divides environmentally responsible behaviours into public environmental behaviours, nonradical environmental behaviours in public places, and environmental behaviours in private places. Smith-Sebasto & D'Costa (1995) defined six types of environmentally responsible behaviours, namely, civic, educational, economic, legal, actual and persuasive behaviours. These six basic behaviours cover all aspects of environmental conservation behaviour and are form a classification of environmentally responsible behaviours that is recognized by most researchers (Ajzen & Fishbein, 1977; Cheng & Wu, 2015; Chiu et al., 2014; Alice S.Y. Chow et al., 2019; Hines et al., 1987; Jackson et al., 2016; Kaiser, 1996; Kollmuss & Agyeman, 2002; Lee & Jan, 2015).

<u>The Planned Behaviour Theory (PBT)</u>

The most popular model to study environmentally responsible behaviour is the planned behaviour theory (TPB), which indicates attitude significantly affects individual behaviour and is an important factor in predicting behaviour. Ajzen and Fishbein (1977) used rational behaviour theory to explore the relationship between attitude and behaviour. This theory holds that behavioural tendency is the best variable for predicting actual behaviour, and the tendency toward a certain behaviour is caused by a person's attitude towards this behaviour and the subjective norms of other individuals towards this behaviour.

However, it is difficult to measure the actual environmentally responsible behaviour for a specific research object. Intention factors determine that the most important factor in predicting individual behaviour is the person's intention to adopt a certain behaviour—which is determined by attitude, subjective norms and perceived behaviour control (Ajzen, 1991). Behavioural beliefs, normative beliefs, control beliefs and ultimately affect whether an individual does or does not implement a given behaviour. Behavioural beliefs refer to positive or negative results experienced by individuals when they perform a particular behaviour (Ajzen, 2005; Fishbein & Ajzen, 2011). Normative beliefs are based on an individual's perception that those closest to him agree or disagree with the implementation of a given behaviour. These perceptions effectively trigger the individual's perceptual norms and the social pressure that the individual feels when deciding to implement a given behaviour. Control beliefs refer to personal or environmental factors that promote or prevent individuals from carrying out certain behavioural intentions. These beliefs reach their peak in perceptual behaviour control, which includes past behaviours and indicates whether a given behaviour can be put into practice (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 2011). The combination of attitude, perceived behavioural control and subjective norm and leads to the formation of behavioural tendency, which in turn becomes the direct antecedent variable for the implementation of a given behaviour (Ajzen, 1991).

Overall, higher level of attitude and perception norms are, the stronger the perception behaviour control is, and the stronger the individual's tendency to implement a certain behaviour. The effectiveness of the theory of planned behaviour in explaining different behaviours in different situations has been verified (Ajzen, 1991; Hines et al., 1987; Kaiser, 1996; Kilbourne & Pickett, 2008). Because it can effectively predict individual behavioural tendencies and actual behaviours, the theory of planned behaviour has become one of the most influential theories for predicting behavioural tendencies, and it has been successfully used to predict behavioural tendencies in various recreational backgrounds, such as participation in recreational activities, international travel, destination selection, and environmentally friendly behaviours in hotel settings (Gu, Gao, Wang, Jiang, & Xu, 2018; Kollmuss & Agyeman, 2002; Lee et al., 2013; Stern, 2000; Thapa, Graefe, & Meyer, 2005). Most studies related to environmentally responsible behaviour are based on the theory of planned behaviour.

<u>The Attitude-Behaviour-Context Theory (ABC)</u>

Attitude-Behaviour-Context Theory (ABC) revealed attitude and external conditions work together to influence environmental behaviour (Guagnano, Stern, & Dietz, 1995). It refers to the individual's environmental behaviour is not only affected by the individual's attitude towards a specific behaviour, but also pays special attention to external conditions for the implementation of environmental behaviour (Figure 2.1).

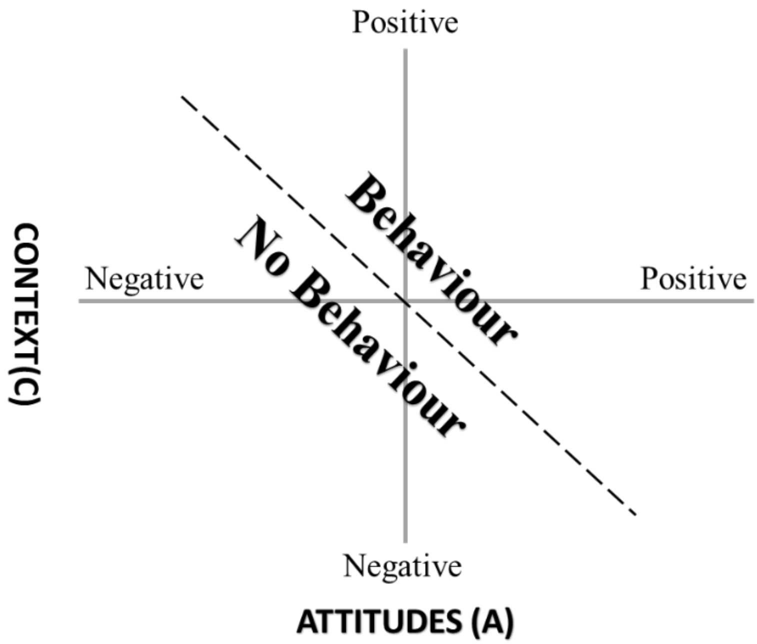

Figure 2.1 The Attitude-Behaviour-Context Model
Source: Adapted from Guagnano et al (1995)

As shown in Figure 2.1, The horizontal axis represents external contexts, which refers to all external contexts that may affect individual to implement environmental behaviour, covering the main relevant aspects of economic, social, legal and policy, including both positive and negative external conditions on the axis. The vertical axis represents individual attitude, including general and specific environmental attitudes and behavioural intentions.

In the ABC theory, Guagnano emphasizes that attitude and external context jointly exert influence on specific environmental behaviour.

There are two main contributions of ABC theory: 1) based on the previous research on psychological variables of attitude, it emphasizes the role of external situational factors. And points out that environmental behaviour is the result of the interaction of attitude and external context. 2) ABC theory elaborates the influence of external context on the behaviour. The external context is the boundary condition that attitude exerts a significant influence on environmentally responsible behaviour.

Normative-Activation Theory (NAM)

Normative-Activation Theory (NAM) is another widely accepted theory of environmentally responsible behaviour, proposed by Schwartz in 1977. Compare with TPB theory, NAM theory is an altruistic behaviour theory, mainly used to predict and explain prosocial behaviour (Schwartz, 1977). In addition to the rational consideration of natural cost, individuals will also be willing to sacrifice their personal interests to participate in environmentally responsible behaviour when the moral norm is activated. This theory holds that the environmental consequences perceived by the individual will lead to the individual's sense of environmental responsibility, which in turn will inspire the individual to participate in the moral norms of a certain behaviour, and ultimately the moral norms will promote the individual to participate in specific environmental responsibility behaviour. Moral norm is the core variable of this theory. When an individual fail to perform a particular action, it can trigger feelings of guilt. The contribution of this theory is that it takes personal moral norms as the core variable, and emphasizes the role of perceptual factors in the environmentally responsible behaviour. NAM has been widely applied in the researches on energy-saving behaviour, waste reduction and reuse (Abrahamse & Steg, 2009; Jansson, Nordlund, & Westin, 2017).

2.2.2 Geologically responsible behaviour

Environmental conservation or damage to a travel destination depends on visitor behaviours. To reduce the damage, several researchers have investigated tourism behaviour (Lee, 2013). Environmentally responsible behaviour measured in geoparks was defined as geologically responsible behaviour (GRB).

GRB has been utilized to assess behaviours in several studies, such as protecting cliffs (Kim et al., 2008) and preserving wild lands (Vaske, Decker, & Manfredo, 1995). Therefore, this research was derived from studies about environmentally responsible behaviour and used to define a new term, "geologically responsible behaviour", meaning geopark visitors who attempted to mitigate negative impacts on geosites, contributed to geological conservation efforts, and did not disturb the geopark geosystem during geo-tourism.

Several studies have attempted to investigate factors affecting GRB, such as environmental knowledge (Packer et al., 2014; Thapa et al., 2005; Vicente-Molina, Fernández-Sáinz, &

Izagirre-Olaizola, 2013), recognition of the negative impacts of behaviour (Puhakka, 2011), and place attachment (Cheng & Wu, 2015; Cheung & Hui, 2018; Halpenny, 2010; Ramkissoon, Weiler, & Smith, 2012; Vaske & Kobrin, 2001). Nonetheless, the research instruments used in these previous studies were formulated on a general basis (Lee et al., 2013), thereby sparking a discussion about defining ERB constructs from both general and site-specific perspectives (F.G. Kaiser et al., 1999; Thapa et al., 2005). Therefore, this study adopted the reliable and valid approach developed by Lee et al. (2013) to estimate visitors' geologically responsible behaviour. Specifically, 9 ERB constructs were selected to estimate the visitors' behaviour, including educational action, financial action, civil action, legal action, physical action, persuasive action, sustainable behaviour, pro-environmental behaviour, and environmentally friendly behaviour.

Researchers have adopted different approaches for measuring environmentally responsible behaviour in their respective studies. Smith-Sebasto & D'Costa (1995) sorted environmentally responsible behaviour with six aspects, namely, educational behaviour, civic behaviour, economic behaviour, legal behaviour, practical behaviour and persuasive behaviour. Civic behaviour refers to individuals or groups taking actions to promote environmental conservation through political channels; these actions do not include donations, strategies such as protesting, voting, participation in public hearings, signing petitions or other similar activities (Cheung, Ma, Lee, Lee, & Lo, 2019; Lee, Lee, Ma, & Cheung, 2019). Educational behaviour refers to any action taken by individuals or groups to acquire relevant environmental knowledge or information related to environmental issues (Cheung, 2010), such as watching TV programmes, reading articles or books, and participating in academic courses (Ballantyne et al., 2005; Niesenbaum & Gorka, 2001; Vicente-Molina et al., 2013). Economic behaviour refers to any behaviour taken by individuals or groups through economic measures such as purchasing or resisting certain goods harmful to the environment, donating money to environmental conservation departments, launching environmental conservation campaigns and other activities (Aguilar & Vlosky, 2007; Lee et al., 2019). Legal behaviour refer to any act of individual or group legal measures to protect the environment (Lee et al., 2019). Practical behaviour refers to any actions taken by individuals or groups to protect the environment without donations, such as picking up casually discarded garbage, participating in community cleaning activities, sorting garbage, and installing energy-saving household equipment (Webb, Soutar, Mazzarol, & Saldaris, 2013). Persuasive behaviour refers to any actions taken by individuals or groups to stimulate others to promote environmental conservation, including writing letters, making speeches, disclosing information, lobbying, etc.

Smith-Sebasto & D'Costa (1995) designed a measurement scale for environmentally responsible behaviour based on six classes of environmental behaviours, determined the corresponding measurement items for each type of behaviour, and finally compiled an environmentally responsible behaviour inventory containing a total of 28 items via data analysis and empirical research. These six basic behaviours cover all aspects of environmental behaviour and are therefore considered to be a relatively comprehensive scale for measuring environmental behaviours; this scale has been widely adopted by scholars in the tourism field (Budeanu, 2007; Lee & Moscardo, 2005; Ma et al., 2018). Many studies are based on these topic lists. According to the relevant research on environmentally responsible behaviour, these lists are largely based on rational behaviour theory and planned behaviour theory, and they predict actual behaviours by measuring behavioural tendencies (Cheung, Lo, et al., 2017; Chow, Cheng, & Cheung, 2019; Lee & Moscardo, 2005).

2.2.3 Influencing factors of environmentally responsible behaviour

The relevant literature shows that demographic characteristics, psychosocial factors, emotional factors and specific situational background affect environmentally responsible behaviour (Bamberg & Möser, 2007; Budeanu, 2007; L. T. Cheung, 2013; Cheung, Chow, Fok, Yu, & Chou, 2017). Demographic variables refer to the gender, age, income level and educational background of respondents. Most studies in this field are exploratory quantitative studies, and the results demonstrated a low level of consistency due to the diverse social and cultural backgrounds of the research population (L. T. Cheung & C. Jim, 2013; Jim & Shan, 2013). For instance, the environmental responsibility behaviour tendency of males is higher than that of females, but the frequency at which females undertake these actions is higher than that of males (Lee, McMahan, & Scott, 2015; Vicente-Molina et al., 2013). This may be due to differences in household roles between men and women; it is the latter who perform most of the everyday household duties. Men instead tend to engage in environmental behaviours that have significant and immediate effects. On the other hand, females showed greater willingness to engage in environmentally friendly behaviours that required long-term emotional involvement and were less difficult to perform (Cottrell, 2003; Packer et al., 2014). Age has shown opposite results in different studies as well. Some studies have found that older tourists are more aware of environmental impacts compared to their younger counterparts (Cheung, Chow, et al., 2017), and older tourists also implement conservative behaviours at scenic spots. However, some studies have found the exact opposite: that older people tend to be more conservative in their attitudes towards environmental actions, while younger groups are more willing to modify their behaviour patterns and participate in environmental actions (Cheung et al., 2014; Wight, 2001). It is possible that older people support ordinary environmental practices but resist aggressive environmental protection. It is also commonly believed that a positive correlation exists between educational background and environmentally responsible behaviour (Cheung, 2010; Wight, 1996). However, many studies have come to the opposite results. This result may occur because although high-income people tend to have more environmental knowledge and pay more attention to environmental issues, low-income people shoulder more of the consequences caused by the destruction of the ecological environment; therefore, they are more sensitive to environmental issues (Eagles & Cascagnette, 1995; Maple, Eagles, & Rolfe, 2010; Tao, Eagles, & Smith, 2004).

In the relevant documents of the driving factors of environmental responsibility behaviour, the positive influence of environmentally responsible attitude on individual implementation intention has also been confirmed by a large number of empirical studies

(Cheung, Lo, et al., 2017; Cheung & Fok, 2013; Gu et al., 2018; Lee & Jan, 2015). Environmentally responsible attitude is one of the most robust direct factors for predicting an individual's intention to implement environmental behaviour.

2.3 Place attachment

Research shows that the emotional relationship between a person and a particular object can significantly affect that individual’s attitude and behaviour toward the object. In this regard, when an emotional link exists between the individual and the environment, the attitude and behaviour patterns of the individual and the environment will also be affected by this emotional relationship. From the perspective of social psychology, place does not equal geographical space; it is a social construct that has specific meaning and value to groups or individuals (Cheung & Hui, 2018; Ramkissoon et al., 2012; Vaske & Kobrin, 2001). Human geographer Tuan (1979) defined "place" as a social construct formed by human experience. The concept of place emphasizes the role of human emotion linked to a space. He believed that place is constructed through personal experience; when individuals attach meaning to a particular geographical space, it becomes a place—an entity to which individuals can attach themselves. In later research, Tuan (1979) indicated that human emotional connectedness to a location is related to the amount and quality (depth) of time a person spent in that location.

When individuals attach specific values to a location and form a positive emotional connection, a sense of emotional attachment is created in other people, the so-called place attachment. Scholars in the fields of environmental psychology and human geography are all regard place attachment is a basic human need (Halpenny, 2010; Kaiser, 1996; Tuan, 1979; Ujang, 2012; Vaske & Kobrin, 2001). Lippard (1997) believes that even in the face of increasing globalization and population migration, place attachment will never disappear because human beings have a psychological need to seek a sense of belonging, and "place" is a geographical manifestation of this psychological need.

The relationship between place attachment and the tourism context has been verified through research. Studies have shown that place attachment significantly affects environmental attitudes, and a positive attitude encourages tourists to be more inclined to take actions beneficial to that ecological environment (Halpenny, 2010; Ramkissoon et al., 2012; Vaske & Kobrin, 2001). An empirical study of visitors to a national park in Australia also found that place has a positive impact on the willingness of tourists to engage in environmentally responsible behaviours, and this relationship is mediated by the satisfaction of the tourists themselves (Larson, De Freitas, & Hicks, 2013; Ramkissoon, Smith, & Weiler, 2013; Ramkissoon et al., 2012).

Scholars have studied place attachment from various angles and used different terms to describe people's feelings towards places, such as rootedness (Relph, 1976), topophilia (Tuan, 1990), place identity (Proshansky, 1978), place attachment (Alawadi, 2016; Cheung

& Hui, 2018; Khaled, 2017), community attachment (Brehm, Eisenhauer, & Krannich, 2006; Lo & Jim, 2015), and place bonding (Hammitt, Kyle, & Oh, 2009; Ramkissoon, Smith, et al., 2013). Although there are slight differences in the terms used by scholars to describe the effect of place between humans and the environment, place attachment is a widely used expression by scholars (Hernandez, Hidalgo, & Ruiz, 2013; Kyle, Absher, & Graefe, 2003; Walker & Ryan, 2008; Williams, 2014).

"Sense of place" is a broad concept that refers to people's feelings about a place. Sense of place represents a person's judgement of, understanding of and emotional attachment to a place. Sense of place integrates both positive and negative emotions generated by human-earth interactions, and the concept therefore carries an environmental meaning. In contrast, place attachment, indicates positive feelings between people and places (Alawadi, 2016; Cheng, C. Wu, & Huang, 2013; Larson et al., 2013; Raymond, Kyttä, & Stedman, 2017). Attachment can be generated to different geographical entities, including people, objects, buildings, landscapes, communities, cities, countries, etc. Fried (1963)revealed for the first time the deep emotional ties formed between people and places in his study on the forced relocation of residents at the western end of Boston. In the 1970s, when psychologists were still exploring the emotional relationship between people, human geographers became interested in the place affect between people and the earth (Tuan, 1979). In the 1980s to the 1990s, environmental psychologists began to study the relationships between people and places, such as territorial research and place identity (Proshansky, 1978). Place attachment in different studies has also provided different definitions of place attachment based on different research concerns. Giuliani and Feldman (1993) believe that place attachment is a positive place affect between an individual and a unique place. Greider and Garkovich (1994) believe that place attachment refers to the symbolic meaning of the environment and its influence on interactions between human beings and the environment. Although scholars have defined the concept of place attachment differently, the concept proposed by Giuliani and Feldman (1993) is widely accepted by other scholars and professionals: "*place attachment emphasizes the positive place affect between people and places*".

Place attachment is not only limited to attachment to the material environment but can also be used to refer to social interactions in a specific environment. Milligan (1998) defined place attachment as including both the material environment and social environment. He believes that the material environment provides a physical space for social activities. Therefore, he believes that place attachment is a meaning given to a geographical environment by individuals through interactive activities, thus forming a place affect between individuals and the environment. This study adopts the definition from Milligan (1998) of the concept of place attachment. The study not only explores visitors' attachment complex to the physical environment or physical environment of the scenic spot but also studies the degree of visitors' attachments to the social environment of the scenic spot. Previous research suggests that individuals are willing to pay more money and time to visit places to which they feel attached (Hosany, Prayag, Van Der Veen, Huang, & Deesilatham, 2017; Kyle et al., 2003; Tonge, Ryan, Moore, & Beckley, 2015). Place attachment is the main motivating factor in revisitation (George & George, 2004; Kyle et al., 2003; Ramkissoon, Smith, et al., 2013; Raymond et al., 2017). Sentiment in opposition to paid-use resources has been eased with an increasing degree of place attachment (George & George, 2004; Halpenny, 2010)

2.3.1 Theoretical basis of place attachment

Place attachment originates from the attachment theory of interpersonal relationship, which was first proposed by Bowlby (Bowlby, 1969, 1982) and then developed by Marvin and Britner (1999), Rholes and Simpson (2004),Hidalgo and Hernandez (2001), Altman and Low (2012), and other scholars. Attachment theory initially studied the emotional bond formed between infants and their main caregivers. The "emotional bond with specific objects" (people or objects) "formed between individuals and specific objects" is defined as attachment (Bowlby, 1969). Bowlby believed that attachment is the human instinctively need for security and survival. Bowlby, who once worked for a British psychoanalysis organization, refused to accept Freud's (1940) view that children's attachment to their caregivers is based on satisfying physiological needs such as hunger. He believed that connections are made between infants and their caregivers because such connections meet infants' psychological needs for comfort and safety. Bowlby (1982) was also concerned about the consequences of severing this attachment. Through observation, it was found that children separated from their parents experience several stages of extreme pain. Bowlby further concluded that this separation would lead to lasting psychological problems. Ainsworth (1967) pointed out how attachment is expressed through behaviours, and similar behaviours were observed between infants and their caregivers in Uganda and Britain, two countries with different cultures, providing cross-cultural verification for this theory. After Bowlby and Ainsworth published their far-reaching results, thousands of papers exploring the theory were published. Bowlby's research results laid the foundation for subsequent scholars to apply attachment theory to related studies beyond the place affect between parents and infants. Currently, attachment theory covers a wide range of fields, including attachment to people, attachment to places and attachment to objects (Daniels, 1992; Rowntree, 1981; Tuan, 1979). The importance and practicability of attachment theory have been widely applied to other fields beyond the development of parent-infant relationships, including consumer behaviour research (Eusébio, Vieira, & Lima, 2018), neighborhood relationship research (Cheung & Hui, 2018; Lo & Jim, 2015) and marketing research. In the marketing field, attachment theory has attracted more and more attention. The first systematic analysis of place attachment appeared in the 1980s. Since then, place attachment has become one of the topics with most concerned in tourism marketing. Similar to interpersonal attachment, place attachment connects tourists with tourism destinations emotionally and psychologically. After becoming representatives of an attachment object, tourists expect to obtain security, trust, self-confidence, attraction, pleasure and identity from visiting that destination (Kil, Holland, Stein, & Ko, 2012; Kyle et al., 2003; Tonge et al., 2015; Walker & Ryan, 2008). Place attachment plays an important role in cultivating visitors' friendly attitudes and behaviours toward tourism destinations (Cheung & Hui, 2018; Halpenny, 2010; Ramkissoon, Graham Smith, & Weiler, 2013).

2.3.2 Dimensions of place attachment

Low & Altman published a monograph on place attachment in 1992 that further discussed the understanding of place attachment as a multidimensional concept; the contents of this monograph are frequently quoted by researchers. Since then, research on place attachment has developed rapidly. Both theoretical and empirical studies show that place attachment is a multidimensional concept. For example, Shumaker & Taylor (1983) proposed the natural, social and emotional components of human-land connections. Traditional research on place attachment has always held that place attachment includes two dimensions, namely, place identity and place dependence (Williams et al. 1992; Williams & Vaske, 2003). Recent research on the nature of place attachment reveals the multidimensional nature of this concept, and the research continues to explore the emotional and social components of place attachment (Jorgensen & Stedman, 2001; Kyle, Graefe & Manning, 2005). Various empirical studies support the emotional attachment dimension of place attachment (Jorgensen & Stedman, 2001; Kyle, Mowen & Tarrant, 2004; Kyle, Graefe & Manning, 2005), place identity dimension (Proshansky, Fabian & Kaminoff, 1983; Kyle, Graefe & Manning, 2005), place dependence dimension (Jorgensen & Stedman, 2001) and social connectivity dimension (Milligan, 1998; Jorgensen & Stedman, 2001; Hidalgo & Hernandez, 2002; Kyle, Mowen & Tarrant, 2004). Among the different dimensions of the concept of place attachment, place dependence and place identity are most widely accepted and recognized by scholars. Most empirical studies on place attachment are also conducted from these two dimensions.

Place identity

Place identity is the most widely accepted and undisputed dimension in the concept of place attachment, and it is an essential research topic for exploring place attachment. Identity is the subjective understanding of one's own heart as an individual (Knez, 2005). Place identity is regarded as the overall concept of social identity or the sub-level concept of individual socialization in the world. It refers to the connection between an individual and a specific environment, which contains the "individual's memory, interpretation, views and feelings for the physical environment or similar environment" (Proshansky, Fabian & Kaminoff, 1983; Prayag & Ryan, 2012). The uniqueness of the physical environment provides individuals with the opportunity to identify with a place (Halpenny, 2010). Individuals usually think that they have a connection with the place where their identity is manifested (Kyle, Mowen & Tarrant, 2004). The purpose of place identity is to help individuals maintain their self-identity. Proshansky et al. (1978) identified three main dimensions of place identity from the existing self-theory: cognitive description, emotional assessment and environmental and object demand dimensions. Place identity can be expressed as a series of things that can help individuals maintain their self-identity. These cognitions are similar to a material environment database that allows individuals to retrieve relevant information used to evaluate the material environment. Some studies regard place identity as a separate concept instead of regarding it as part of place attachment.

Place dependence

Place dependence has gradually become a dimension of place attachment recognized and determined by researchers in the past ten years it. Williams & Roggenbuck (1989) equals place dependence to the functional dependence of individuals on a place because that place provides the resources or facilities individual need to carry out certain special activities. Compared with other places, a dependent place can better meet the needs of individual activities, and it cannot be replaced by other places (Milligan, 1998). This dependence involves an evaluation and comparison process, i.e., individuals compare the results experienced in the selected existing sites with the results that might have been experienced if other sites had been selected. Jorgenson & Stedman (2001) defined place dependence as focusing on "the superiority of one place over other places in meeting individual needs within the range of possible choices". The concept of place dependence emphasizes that people's evaluations of a place should be compared with other alternative places so that their evaluations can be determined according to the satisfaction these places provide to meet (Backlund, 2003).

Place affect

Place affect is usually mentioned only indirectly in the relevant studies on place attachment, and few environmental psychology studies have studied this dimension explicitly. Jorgenson & Stedman (2001) believe that emotional attachment is the place affect that people produce in response to a specific environment. Tuan (1977) showed that emotion is associated with all human experiences and that all human experiences occur in through experience with the physical environment. Although empirical studies have confirmed and supported the existence of the emotional dimension in the construction of place attachment, there are fewer studies on emotional attachment compared with other dimensions of place attachment. Jorgenson & Stedman (2001) studied the attachment degree of lakeside vacation family members to their homes and found that compared with other dimensions of place attachment, the average score of the subjects on emotional factors was much higher. Kyle, Graefe & Manning (2005) also provided supporting evidence for the emotional attachment dimension when studying the relationship between place attachment and activity motivation.

<u>Place social bonding</u>

Low & Altman (1992) emphasized the social bonding of place attachment, holding that "place is a place and an environment in which interpersonal, community and cultural relationships occur. People are attached not only to place itself but also to the social relationships in that place." Some studies have shown that social communication with friends and relatives a main cause of place attachment (Guest & Lee, 1984). Hidalgo & Hernandez (2001) found that an individual's attachment to local society is higher than their attachment to the physical environment in different spatial backgrounds when making comparisons between an individual's social connections to the environment and the physical environment. Mesch & Manor (1998) found that the number and intensity of interpersonal relationships established by individuals in a certain environment have a significant impact on their place attachment. Therefore, when exploring the place attachment complex of tourists to the place visited, the possible social relationships between tourists and service personnel is included in the study as one of the dimensions of the place attachment of tourists to the destinations.

2.3.3 Measurement of place attachment

Williams & Roggenbuck (1989) and Williams et al. (1992) were the first researchers to design a place attachment measurement scale. Place dependence, place affect, place identity and place social bonding are regarded as the main dimensions of place attachment. Williams & Vaske (2003) explained the quantitative measurement of place dependence and place identity is usually conducted through Likert scale measures, allowing subjects to indicate their degree of agreement. Several items have often been used to measure these concepts, but Williams & Vaske believed that using only a few items was sufficient to measure every dimension of place attachment. They found that the following items related to place dependence are highly universal and reliable: (1) This place is the best place for me to do what I like to do; (2) No other place can compare with this place; (3) The satisfaction I get from visiting this place is stronger than that from any other place. (4) The importance of doing things in this place is greater than that in other places; (5) I will not replace this place with any other place. They also proposed that the following items (which measure place identity) are highly universal and reliable: (1) I feel this place is a part of my life; (2) I strongly agree with this place; (3) I am very attached to this place; (4) Visiting this place reflects my personal identity; and (5) This place is of great significance to me. Williams & Vaske (2003) also provided a series of suggestions for future researchers, hoping to study people's place attachment to leisure places. First, they suggested that researchers should focus on the correlations between place attachment and other social and demographic characteristics, including age, gender, political orientation, willingness-to-pay, etc. They also hoped that future researchers would improve the understanding of the concept of place attachment by exploring other dimensions of the concept.

2.4 Environmentally responsible attitude

The "New Ecological Paradigm" (NEP) is the most popular theoretical framework used to estimate the environmentally responsible attitude. The NEP was first proposed by Van Liere and Dunlap in 1979 and later updated in 2000, is a scale that includes 15 statements under 5 dimensions (Dunlap et al., 2000). The NEP has also been applied in studies examined Chinese tourists' environmentally responsible attitude. Li (2005b) classified tourists into different segments—from casual to serious ecotourists in the Baihuashan nature reserve—based on their score from the NEP. The average NEP score was 3.85 out of 5.0, which indicate that these tourists were relatively "green".

The attitudes in this research were identified as positive opinions and feelings towards the conservation and geosystem utility of geopark visitors (Tayci & Uysal, 2012); however, only limited research has been conducted on how environmentally responsible attitude support sustainable development in geoparks'. In this study, environmentally responsible attitudes are assessed by the revised New Ecological Paradigm (NEP) (with slight modifications).

2.4.1 Environmentally responsible attitude

The research on environmentally responsible attitude was begun by psychologists to investigate the causes of environmental problems. However, the use of the concept of an environmentally responsible attitude is confused. While different scholars have different opinions, they often include environmental concern, environmental awareness, environmental concern, etc. Ward & Braucht believe that environmentally responsible attitude include not only cognition, emotion and behavioural intention with regard to an environment but also the actual actions taken. Heberlein also supports this definition, believing that environmentally responsible attitude are people's reactions and expressions to the formation of objects in a certain environment based on their own experiences, including general environmental behaviours and special environmental behaviours. However, as the research advanced, practical actions were gradually excluded. Fishbein & Ajzen define environmentally responsible attitude as a tendency held by subjects with environmentally responsible behaviour that has a certain influence on predicting environmentally responsible behaviour. Lucy & Taciano reviewed and analysed the research published in the past 30 years and concluded that environmentally responsible attitude is a type of psychological tendency and that environmentally responsible attitude research is an important part of psychological research.

The concept of domestic scholars' attitudes towards the environment generally tends towards people's beliefs and views on environmental issues. Yan Sun (2008) compiled a detailed summary of the research on environmentally responsible attitude, believing that environmentally responsible attitude includes both specific and general environmentally responsible attitude. Specific environmentally responsible attitude are attitudes towards specific environmental behaviours, while general environmentally responsible attitude are general attitudes towards environmental and environmental problems. From the above analysis, it can be seen that foreign scholars' understanding of the concept of environmentally responsible attitude has a tendency to converge and become integrated. Environmentally responsible attitude is a set of beliefs, emotions and behavioural intentions held by individuals regarding environmental-related activities and problems (Schultz, SH River, T Abanico, & Khazian). Combined with a large number of studies on ecotourism and wetland parks, through expert interviews and tourist interviews, the four dimensions of environmentally responsible attitude are specifically defined as environmental knowledge, environmental ethics, environmental emotion, and environmental responsibility.

2.4.2 New ecological paradigm

In 2000, Dunlap, Vanliere, Mertig and Jones revised the scale in response to changes in environmental problems, adding the possibility of refusing exemption and ecological crisis to the original scale, and renamed it the New Ecological Paradigm Scale. Professor Hong Dayong of Renmin University of China accepted Professor Dunlap's suggestion and used the Chinese version of the NEP scale for the first time in the China Comprehensive Social Survey (urban park) in 2003. Based on this survey, the effect of applying the NEP scale in China was evaluated. At present, Chinese cities are experiencing a paradigm shift in ecological value, that is, from the traditional social paradigm to a new ecological paradigm. Schultz developed the Environmental Concern Scale, which is the most widely used environmental scale. In this study, a Likert five-point scale was used to measure 14 items concerning visitors' environmentally responsible attitude.

2.5 Visitor Satisfaction

2.5.1 Definition

The related research on visitor satisfaction is based on the theory of customer satisfaction, which was started in 1956 by American scholar Cardozo. Until the mid-1990s, the generally accepted model of customer response was developed named difference theory. Difference theory suggests that satisfaction is determined when customers compare their perceptions of the quality of a product or service with their expectations (Oliver, 2000). In the Quality Management System Standard ISO2000, customer satisfaction is defined as the customer's degree of contentment. Therefore, the degree of customer satisfaction is the emotional response to the gap between the customer's expectations and their actual perceptions. In the tourism context, visitor satisfaction is the result of comparing a visitor's expectations of a destination during a trip with the tourist's actual experiences when visiting the destination (Pizam, Neumann, & Reichel, 1978). If the perception meets or exceeds expectations, the visitor is satisfied. Some studies indicate that visitor satisfaction will increase based on the degree of conformity between tourists and tourism environment

(Alegre & Garau, 2010).

2.5.2 Visitor satisfaction evaluation

Accurate assessment of visitor satisfaction is the premise for improving tourism products and services. The main methods of evaluating visitor satisfaction are the Service Quality Measurement Scale (SERVQUAL), service process analysis (SBA), importance performance analysis (IPA), grey correlation analysis, and so on. Scholars have proposed 8 visitor satisfaction factors, including cost, beaches, accommodation facilities, catering facilities, recreation opportunities, environment and degree of commercialization (Pizam et al., 1978). In addition, the factors contributing to satisfaction also include cultural communication, activity involvement, convenience and price. The factors that lead to dissatisfaction are inadequate service and overexploitation (Alegre & Garau, 2010) . The large number of visitor satisfaction evaluation systems has made the factor that influence visitor satisfaction clearer.

Chapter 3: Methodology

3.1 Conceptual models and hypotheses construction

3.1.1 Research conceptual model

In the previous theoretical review, several classical theories of environmental behavior have been reviewed. TPB is a popular theory in the studies of environmental behavior, emphasizing the relationship between attitudes, subjective norms, perceived behavioral control, intention and behavior. But the independent variables of subjective norms and perceived behavioral control are more based on individual's rational thinking. Compare with TPB theory, NAM theory is an altruistic behaviour theory which takes moral norms as the core variable. In addition to the rational consideration of natural cost, individuals will also be willing to sacrifice their personal interests to participate in environmentally responsible behaviour when the moral norm is activated. The theories of TPB and NAM are both belong to the category of psychological perception variables. But the current environmental behavior research pays more and more attention to the influence of external contexts. This research aims to integrate the above theory models, keeping the core psychological driving factor and adding the perceived contextual factors. Regarding the psychological driving factor, the positive influence of environmentally responsible attitude on individual has been confirmed by a large number of empirical studies (Cheung, Lo, et al., 2017; Cheung & Fok, 2013; Gu et al., 2018; Lee & Jan, 2015). Regarding the perceived contextual factors, place attachment and place satisfaction are also highly predictive to ERB(Alawadi, 2016; Alice S.Y. Chow et al., 2019; Ramkissoon, Smith, et al., 2013).

Therefore, the theoretical model of this research is shown in the Figure 3.1.

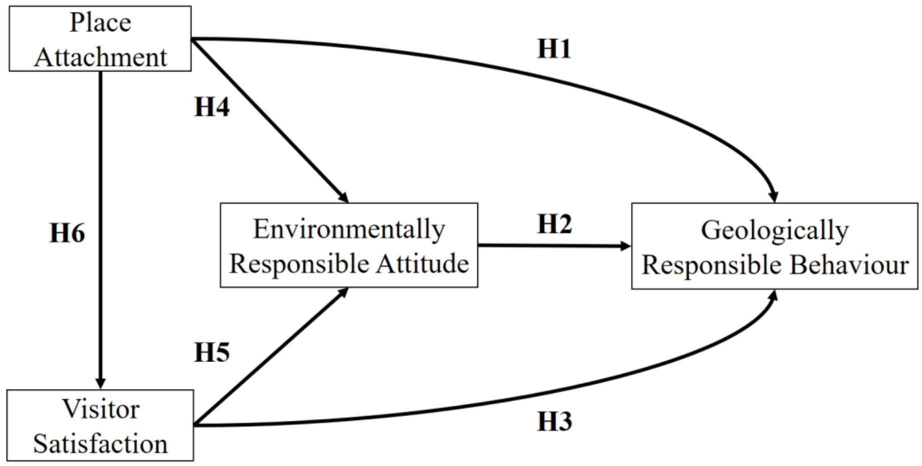

Figure 3.1 Research conceptual model

3.1.2 Hypotheses construction

According to the research conceptual model, the study proposes the following six hypotheses:

H1: Place attachment directly affects geologically responsible behaviour.

Place theory has been applied to analysis the formation mechanism of environmentally responsible behaviour is the hotspot in the recent researches. An empirical study of visitors to a national park in Australia also found that place has a positive impact on the willingness of tourists to engage in environmentally responsible behaviours, and this relationship is mediated by the satisfaction of the tourists themselves (Larson, De Freitas, & Hicks, 2013;

Ramkissoon, Smith, & Weiler, 2013; Ramkissoon et al., 2012). Environmental psychologists put forward the concept to place attachment, indicate that individual in a specific place will feel attached to the environment (Altman & Low, 2012). When individuals attach to a specific place, they are more likely to have environmentally responsible behaviors, such as picking up garbage(Walker & Ryan, 2008), paying for environmental protection (Halpenny, 2010), participating in environmental public welfare activities and providing volunteer services(Fairweather, Maslin, & Simmons, 2005). Therefore, this study proposes the above hypothesis H1.

H2: Environmentally responsible attitude directly affects geologically responsible behaviour.

In the relevant documents of the driving factors of environmental responsibility behaviour, the positive influence of environmentally responsible attitude on individual implementation intention has also been confirmed by a large number of empirical studies (Cheung, Lo, et al., 2017; Cheung & Fok, 2013; Gu et al., 2018; Lee & Jan, 2015). Environmentally responsible attitude is one of the most robust direct factors for predicting an individual's intention to implement environmental behaviour. Therefore, the above hypothesis of H2 is put forward.

H3: Visitor satisfaction directly affects geologically responsible behaviour.

Many empirical research results show that there is a significant correlation between visitor satisfaction and environmental behaviours (Kyle et al., 2004a; Lee, Graefe, & Burns, 2007). The higher the satisfaction of visitors, their behavior will also be more environmentally friendly. (Mechinda et al., 2009). Therefore, this study proposes the above hypothesis H3.

H4: Place attachment directly affects environmentally responsible attitude.

The relationship between place attachment and the tourism context has been verified through research. Studies have shown that place attachment significantly affects environmental attitudes, and a positive attitude encourages tourists to be more inclined to take actions beneficial to that ecological environment (Halpenny, 2010; Ramkissoon et al., 2012; Vaske & Kobrin, 2001). Place attachment is seen as a potentially important antecedent variable that affects tourism resource conservation awareness, pro-environmental attitudes (Lee, 2011; Raymond et al., 2011; Scannell & Gifford, 2010b; Burleyet al., 2007; Walker & Ryan, 2008). Therefore, this study proposes the above hypotheses H4.

H5: Visitor satisfaction directly affects environmentally responsible attitude.

Studies on recreation activities in wetland parks have shown that visitors' environmental attitude is related to visitor satisfaction (Shen, 2015). When the actual perception of the tourist destination is greater than the expectation, the visitor is satisfied with the destination, the visitors were more willing to protect the local natural environment and tourism facilities.

Therefore, this study proposes the above hypotheses H5.

H6: Place attachment directly affects visitor satisfaction.

Many empirical research results show that there is a significant correlation between individuals' place attachment and their satisfaction (Ramkissoon et al., 2012; Yuksel et al., 2010). Therefore, the study put forward the above hypothesis H6.

3.2 Study Areas

Three geoparks in the Greater China Region were chosen as study areas (in Figure 3.2), including Hong Kong Global Geopark in Hong Kong, Yehliu Geopark in Taiwan, Danxiashan Global Geopark in Mainland China. This study selected these three geoparks firstly based on the geological importance to the specific region. All selected geoparks have been designated geological reserves of the highest level in that specific regions. They are all important geo-tourism destinations for promoting environmental and scientific education. Namely, the first name that comes to mind or recommended by local people when the individual wants to visit the geological landscape in a particular area. With this clear standards, Hong Kong Global Geopark, Danxiashan Global Geopark and Yehliu Geopark were definitely chosen from these three regions. Hong Kong Global Geopark and Danxiashan Global Geopark is the only world-class geological resources to the particular regions. And the importance of Yehliu Geopark is no less than world-class. Just for political reasons, cannot be certified by the UNESCO Global Geopark Network. Beside, Yehliu Geopark is the first park in Taiwan to adopt the concept of a UNESCO Geopark as its transformation and management objective (Yiling & Junquan, 2010).

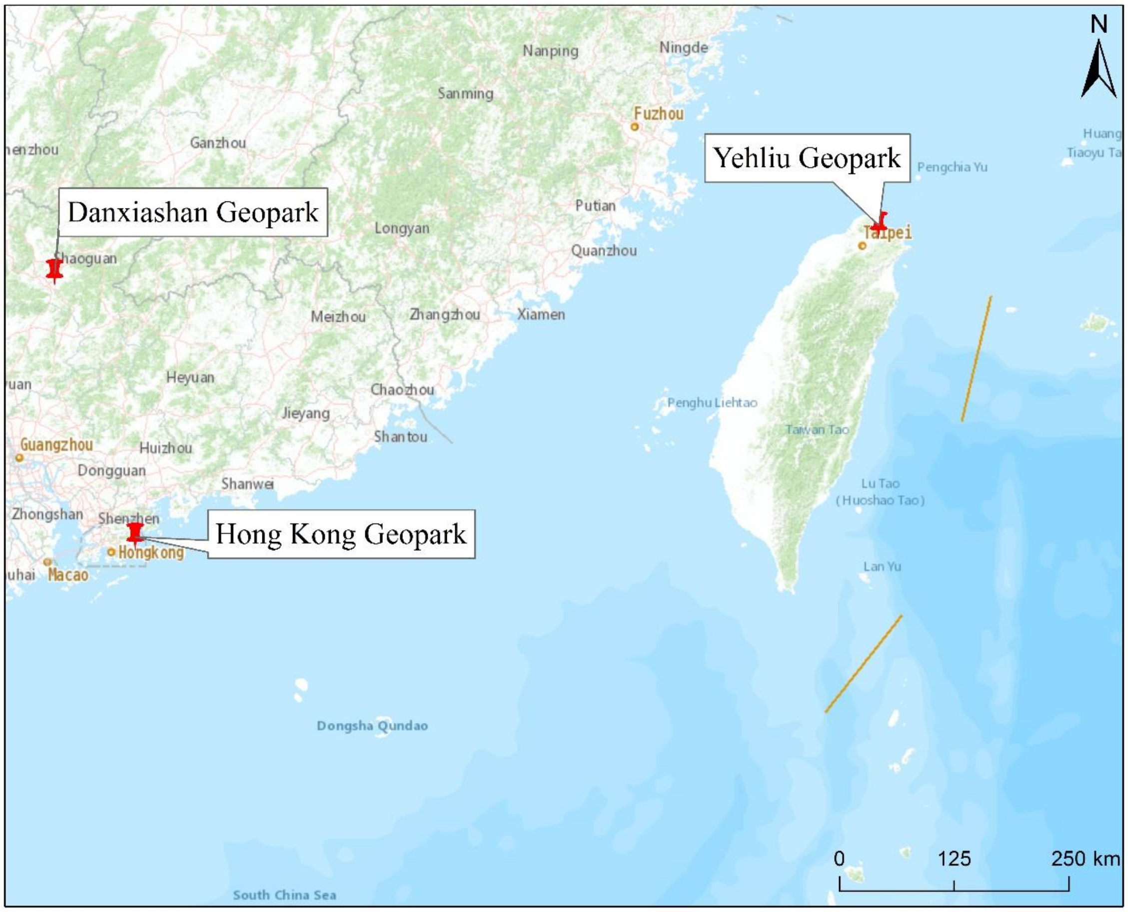

Figure 3.2 Locations of the study areas (edited from online map from Environmental Systems Research Institute)

Secondly, this study selected these three geoparks also based on their accessibility and number of visitors. Specifically, accessibility ensures the feasibility of conducting an extensive on-site questionnaire survey, while a large number of visitors can ensure a sufficient sample size. The following paragraphs provide the relevant background of these three geoparks, followed by a factual comparison of them.

3.2.1 Establishment, management and legislation

The three targeted geoparks are located in different regions and are managed under different authorities; thus, their management and legislation are quite different, as shown in Table 3.1. Their differences are elaborated in the paragraphs below.

Table 3.1 Establishment, management and legislation of three geoparks

	Establish	Management Authority	Legislation
HK Geopark	2008	Agriculture, Fisheries and Conservation Department (AFCD)	• Country Parks Ordinance; • Marine Parks Ordinance.
Yehliu Geopark	2003	• North Coast & Guanyinshan National Scenic Area Administration; • Neo-Space International Inc. (Business sector).	• Act for the Development of Tourism; • Regulations Governing the Management of Designated Scenic Areas.
DXS Geopark	2004	• Administrative Committee of Danxiashan; • Co-management with Management Bureau of Danxiashan National Natural Conservation Area of Shaoguan City.	• Regulations of the People's Republic of China on Nature Reserves; • Regulations on Scenic and Historic Areas; • Guangdong Province Geological Environment Management Regulations.

<u>Hong Kong UNESCO Global Geopark</u>

The Hong Kong Global Geopark was built in 2008 and became a Chinese National Geopark in 2009, joined the Global Geoparks Network in 2011. And then, it also changed its name from the Hong Kong National Geopark to the Hong Kong Global Geopark of China. In 2015, it officially updated its name to the Hong Kong UNESCO Global Geopark.

Before the establishment of the Hong Kong Global Geopark, most of the current geosites were covered by existing country park and marine park. Thus, the Hong Kong government established the Hong Kong Geopark under the existing Country Parks Ordinance and the Marine Parks Ordinance, and the existing ordinances have been managed by the Agriculture, Fisheries and Conservation Department (AFCD) of the HKSAR government. The aim of the geopark is geological conservation, education and sustainable development through regional participation to improve rural life and promote scientific popularization and geo-tourism.

Yehliu Geopark

The Taipei County government has promoted Yehliu as an international scenic spot since 1964. In 2003, the Tourism Bureau of Taiwan integrated the North Coast, the Guangyinshan National Scenic Area and Yehliu into a new region managed by the North Coast & Guanyinshan National Scenic Area Administration. The Yehliu Geopark was established at this time. Since 2006, the government has entrusted the management of the park to Neo-Space International Inc. based on the principles of preservation, research, education and recreation under the Act for the Development of Tourism and Regulations Governing the Management of Designated Scenic Areas.

Danxiashan Global Geopark

Danxiashan was certified as a UNESCO World Heritage sitein 1988. Now, it is also recognized as a National Park of China, a National Nature Reserve and a National 5A Tourist Attraction. On February 13, 2004, UNESCO approved the inclusion of the Danxiashan Geopark in the first batch of global geoparks. It is co-managed by the Administrative Committee of Danxiashan and the Management Bureau of the Danxiashan National Natural Conservation Area of Shaoguan City, Guangdong Province. The Provisions of Guangdong Province on the Conservation and Administration of Danxiashan are based on the Regulations of the People's Republic of China on Nature Reserves, the Regulations on Scenic and Historic Areas and Guangdong Province Geological Environment Management Regulations.

3.2.2 Location, size, transportation and geological characteristics

The location, size, transportation and geological characteristics of the three geoparks are displayed in

Table 3.2.

Table 3.2 Location, size, transportation and geological characteristics of three geoparks

	Location	Size (km^2)	Transportation	Geological Characteristics
HK Geopark	In eastern and northeastern parts of the New Territories in Hong Kong	50	20km to city center; 46km to airport; 19km to intercity trainstation.	Sedimentary rock; Volcanic landform (hexagonal rock columns).
Yehliu Geopark	At the top of the North coast of Taiwan	0.24	34km to Taipei; 69km to airport; 15km to intercity trainstation.	Sedimentary formation; Sandstone (mainly).
DXS Geopark	In the northeast of Shaoguan City, Guangdong Province, China	292	254km to Guangzhou; 234km to airport; 59km to intercity trainstation.	Danxia landform; Red pebbly Sandstone.

Hong Kong UNESCO Global Geopark (Hong Kong Geopark)

The Hong Kong Special Administrative Region is located on the southern coast of China, with a land area of 1,106 km² composed of Hong Kong Island, Kowloon and the New Territories. Located in the eastern and north-eastern parts of the New Territories in Hong Kong, the Hong Kong Geopark covers 50 km² of land. As Hong Kong is a highly urbanized metropolis, the Hong Kong Geopark enjoys convenient transportation. It is approximately 20 km away from the city centre, 46 km from the international airport and 19 km from an intercity train station. Geographically, the Hong Kong Geopark consists of the Northeast New Territories the Sedimentary Rock Region and the Sai Kung Volcanic Rock Region. The Sai Kung Volcanic Rock Region showcases globally rare hexagonal rock columns (Figure 3.3&Figure 3.4), and the Northeast New Territories Sedimentary Rock Region shows various sedimentary units up to 400 million years old.

Yehliu Geopark

Located at the tip of the north coast of Taiwan, the Yehliu Geopark covers an area of 0.24 km² with sandstone formations. It is approximately 34 km away from the city centre, 69 km from the international airport and 15 km from an intercity train station. The distance from the entrance of the Yehliu Geopark to the end is approximately 1.7 km, and the widest area in between is less than 300 m. The distance measured from Yehliu Stop at Jijin

Figure 3.3 Hexagonal rock columns (profile photo)

Figure 3.4 Hexagonal rock columns (transverse photo)

Highway to the end of the cape is approximately 2.4 km. Geologically, the Yehliu Geopark shows sedimentary formations mainly consisting of sandstone and interbedded with mudstone and shale. In addition, the influences caused by weathering, wave erosion, and earth and crustal movement all contribute to the formation of this rare and stunning geological landscape with typical cuesta (Figure 3.5) and many wondrous rocks. The most famous and popular mushroom rock is named the Queen’s Head, which is shaped like the profile of the head a queen, with a large head and a thin neck. Another group of mushroom rocks is named “Cute Princess” (Figure 3.6), which has been newly made in the landscape and is considered the successor of the Queen’s Head.

Figure 3.5 Cuesta scarp

Figure 3.6 Mushroom rock named “Cute Princess”

<u>Danxiashan Global Geopark (Danxiashan Geopark)</u>

Located in the northeast of Shaoguan City, Guangdong Province, with a total area of 292 km², the Danxiashan Global Geopark is named after the Danxia landform (Figure 3.8). It is approximately 254 km away from Guangzhou, 234 km from the airport and 59 km from an intercity train station. The park benefits from high-speed rail, and the time required to arrive at the Danxiashan Geopark from Guangzhou is approximately 1 hour by rail and 50 minutes driving. The Danxiashan Geopark is composed of red pebbly sandstone, which has been eroded over time into a series of outcrops surrounded by spectacular cliffs and many unusual rock formations known as the Danxia landform (Peng, 2000). The parent material of the Danxia landform is a red river and lacustrine conglomerate formed in the late Cretaceous approximately 70 to 90 million years ago. Approximately 65 million years ago, the geopark region was affected by tectonic movement, resulting in many faults and joints (Peng, 2000). There are a number of temples located on the mountains, and many scenic walks can be undertaken. The meanders of the Jinjiang River have etched themselves into the geology, and on them, boat trips can be taken. However, the main attractions of the Danxiashan Geopark are the following geo-sites: 1) the Yang Yuan Stone ('male stone') (Figure 3.7), which bears a remarkable resemblance to reproductive worship; 2) the Breasts Stone, human breast-shaped rocky outcrops on a cliff hanging 30 m above the ground; and 4) Sleeping Beauty, a rocky range resembling a sleeping maiden.

Figure 3.8 Danxia Landform

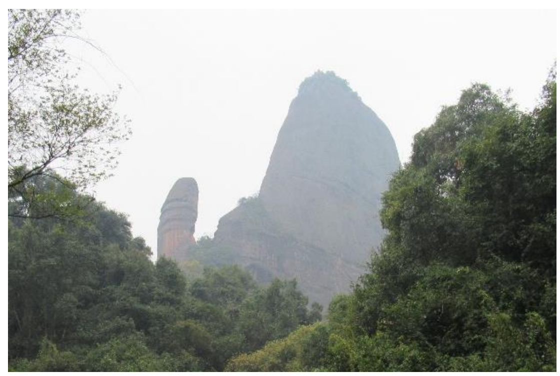

Figure 3.7 Yang Yuan Stone ("Male Stone")

3.2.3 Number of visitors, admission fees and tourism revenues

The number of visitors, admission fees and tourism revenues of the three geoparks are displayed in Table 3.3. The details are introduced separately in the paragraphs below.

Table 3.3 Visitor number, admission fee and tourism revenues of three geoparks

	Visitor number	Admission fee (USD)	Tourism revenues (direct)
HK Geopark	1.48 million (2018)	0	0
Yehliu Geopark	2.39 million (2017)	\$2.6	\$4.71 million
DXS Geopark	2.65 million (2018)	\$14.7 on weekday \$17.7 on weekend \$4.4 for local	\$51.72 million

Hong Kong UNESCO Global Geopark

Since its opening in 2009, there have never been accurate figures on the number of visitors at the Hong Kong Geopark. This is due to the nature of its 'open boundary' and the lack of an application entry fee policy. The number of visitors is therefore always an estimation. For recent years, according to reports by the Country and Marine Parks Board, the officials data were 1.48 million, which is approximately 12% of the total number of visitors to country parks (AFCD, 2018). Although there is no direct income collected from entrance tickets, the Hong Kong Geopark brings social and economic benefits to surrounding communities and Hong Kong.

Yehliu Geopark

Unlike Hong Kong Geopark and Danxiashan Geopark, Yehliu Geopark charge the admission fees. But implement an indiscriminate ticket system, the admission fee of Yehliu Geopark is TWD 80 (USD2.6) for every individual visitor. In 2017, the total number of visitors is 2.39 million, the admission revenue was approximately TWD 119 million (USD 3.85 million), accounting for 81.4% of total revenue. The total revenue, including admission fees, food and beverages, souvenirs and environmental education programmes, was TWD145 million (=UDS 4.71 million).

Danxiashan Global Geopark

At present, the admission fee policy of DXS is RMB 100 (USD 14.7) on weekdays and RMB 120 (USD 17.7) on holidays and weekends, and local citizens may enjoy an annual entry card with unlimited access for RMB 30 (USD 4.4). The total number of visitors visiting DXS was 2.65 million, and the total tourism revenue was approximately RMB 350 million (USD 51.72 million) (2018).

3.2.4 Geo-sites and Geo-route

Hong Kong UNESCO Global Geopark

The Hong Kong Geopark consists of two parts: The Sai Kung Volcanic Rock Region and the Northeast New Territories Sedimentary Rock Region. In total, 8 geo-sites are evenly distributed in these two regions: High Island, Sharp Island, the Ninepin Group and the Ung Kong Group in the Sai Kung Region and Bluff Head-Port Island, Double Haven, the Tolo Channel and Tung Ping Chau in the New Territories Region (

Table 3.4).

Table 3.4 Geo-sites distribution in Hong Kong Geopark

Region	Area	Geosite	Features
Northest New Territories Seedimentary Rock Region	Bluff Headport Island	Port Island	An island of red rocks, formed in the age of dinosaurs
		Bluff Head	The inter-layered red and white rock strata display the oldest rocks in Hong Kong, formed about 400 million years ago
	Tolo Channel	Ma Shi Chau	Colourful mudstone formed over 200 million years ago
		Lai Chi Chong	Clear and colourful laminated rocks, with large bent rock strata as the most interesting geological feature
	Tung Ping Chau		1)Unique coastal landscapes formed by wave abrasion;
			2)The youngest rock strata in Hong Kong, formed 55 million years ago
	Double Haven	Lai Chi Wo	Strong Hakka cultural beritage and rich biodiverstiy
		Double Haven	Beautiful scenery, known as 'little guilin of HK'
Sai Kung Volcanic Rock Region	High Island	Sai Wan	Beautiful coastal landforms in Tai long Wan
		Fa Shan	Hexagonal rock columns distributed on the coast of High Island
	Sharp Island		Tombolo, Unique 'Pineapple Bun' Boulders
	Ung Kong Group	Wang Chau	Natural hexagonal column mural, famous sea arch called 'little Taiwan'
	North Ninepin Group		Spiral Staircase, many famous geological landscapes formed by wave erosion on the hexagonal rock columns

Sourcing: Hong Kong Geopark website.

To promote geological scenery, environmental education and visitor safety, there are 2 boat tour routes and 9 land tour routes proposed by the government in the geopark (

Table 3.5).

Table 3.5 Geo-routes in Hong Kong Geopark

	Route	Distance (km)	Duration(hr)
Boat-tour	Northeast New Territories	--	6
	Sai Kung Islands	--	4
Land-tour	Sharp Island Geo Trail	1 (round trip)	1
	Tai Long Wan Hiking Trail	1.2	5
	High Island Geo Trail	2.8(round trip)	2
	Lai Chi Chong Geosite	1(round trip)	1
	Ma Shi Chau Nature Trail	3(round trip)	2
	Kat O Nature Trail	1	1
	Ap Chau Geosite	1(round trip)	1
	Lai Chi Wo Nature Trail	1.2	1
	Ping Chau Country Trail	6	3

Yehliu Geopark

The Yehliu Geopark is a slim cape that covers only 0.24 km^2 of land. The distance from the entrance of the Yehliu Geopark to the end is approximately 1.7 km, and the widest area in between is less than 300 m. Therefore, there are no geo-tour routes in the park, as all geo-sites can be appreciated within 30 minutes. Worked by weathering, erosion and tectonics, the Yehliu Geopark has typical cuestas and many wondrous rocks. The most famous and popular mushroom rock is named the Queen's Head, which is shaped like the profile of the head a queen, with a large head and a thin neck. Another group of mushroom rocks is named 'Cute Princess', which has been newly made in the landscape and is considered the successor of the Queen's Head. The candle rocks look like candles formed by the erosion of tides and waves, and the whirling effect on the rocks will eventually shape them into candles. Ginger rocks are scattered between areas of mushroom rocks and candle rocks; they appear dark brown and stand out from the surface of the ground with a rusty colour and a shape resembling an old ginger. Other rocks include the Tofu Rock, sea-eroded pot holes, sea grooves, the Geisha's Head, the Dragon's Head Rock, the Marine Bird Rock, and the Ice Cream Rock.

Danxiashan Global Geopark

Both natural and human landscapes are combined in DXS, but the geological sites including crags, canyons, caves, rare rocks, stone forests and the Danxia landform, are the main attractions. To promote the geomorphology of the Danxia landscape and help visitors have a better travel experience, there are 9 geo-tour routes in DXS, including 6 land tour routes, 2 boat tour routes and 1 combined route (Table 3.6).

Table 3.6 Geo-route in Danxiashan Geopark

	Route	Distance(km)	Duration(hr)
Boat-tour	Appreciate Danxia on the water	6	1
	Mianjiang bamboo raft	7	1
Land-tour	Jingshi Rock Trail	1.3	2
	Zhanglaofeng Trail	4	4-3
	Wolonggang-baotafeng Trail	5.5	5-4
	Yuangyuan Rock-Ximeizhai Route	4	3-2
	Tongtaiqiao-Huanyuandong Trail	2.5	2
	Bazhai Trail	5.5	6
Combined	Xianglong Lake-Yinyuan Rock Route	3	3-2

3.3 Questionnaire Survey

In this research, a questionnaire is the main instrument. On-site questionnaire survey was conducted in the three selected geoparks. Visitors who visited these geoparks were invited to complete the questionnaire to glean their views, including their perceptions and their willingness-to-pay for geopark conservation, and to explore the visitors' environmentally friendly behaviour. The questionnaire was developed in English (Appendices A) and then translated into both traditional Chinese (Appendices B) and simplified Chinese (Appendices C) to fit the different regions. As the object of this study is Chinese visitor, the questionnaire survey was conducted in only spoken and written Chinese (Mandarin, Cantonese, simplified and traditional Chinese). Only when the respondent was not fluent in Chinese as a native speaker, the question of ethnicity will be raised.

3.3.1 Questionnaire Design

The questionnaire consists of 6 sections: place attachment, environmentally responsible attitude, environmentally responsible behaviour, visitor satisfaction, willingness-to-pay and socio-economic information. Most items in the questionnaire adopt a five-point Likert scale to measure the geopark visitors' degree of agreement to various statements. Part I, with 17 items, explores the place attachment of the visitors to understand how they feel a sense of attachment to the geoparks that they have visited. The items were designed based on previous studies (Cheung & Hui, 2018; Alice S.Y. Chow et al., 2019; Halpenny, 2006; Prayag & Ryan, 2012) and were slightly revised according to the local context. Environmentally responsible attitude were accessed in part II, which has 9 items drawn from the well-known New Environmental Paradigm (NEP) scale (R. E. Dunlap, K. D. Van Liere, A. G. Mertig, & R. E. Jones, 2000; Noblet, Anderson, & Teisl, 2013). Part III, with 14 items, measures environmentally responsible behaviour. All items were designed based on the study by Kaiser, Wölfing, and Fuhrer (1999) and were modified to be more oriented towards geological conservation. Part IV assesses geopark visitor satisfaction; the 16 items in this part cover both the hardware facilities and customer services of the geoparks to holistically measure the satisfaction of geopark visitors. Part V of the questionnaire assesses the willingness-to-pay of Chinese geopark visitors to support geopark conservation and management.

The respondents were asked to state the amount that they would accept to pay when they are willing to pay for the conservation. For those respondents who were not willing to pay, a number of options were designed for them to choose from. The aim of these options was to understand the reasons for these respondents' lack of willingness-to-pay to identify those protest responses.

3.3.2 Sampling Method

Hong Kong UNESCO Global Geopark

At the Hong Kong Geopark, on-site questionnaire surveys and field surveys were conducted from mid-May to early June 2017. A questionnaire survey was conducted on three weekends between May and June 2017. Two popular geosites, Sharp Island and Tung Ping Chau, were selected as field survey sites. Sharp Island was chosen to represent the Sai

Kung Volcanic Rock Region, while Tung Ping Chau represented the Northeast New Territories Sedimentary Rock Region. Six student helpers were trained to conduct face-to-face interviews with visitors who completed the geo-tour in the geopark. The student helpers randomly invited respondents who had completed a boat trip at the geopark, and 1 out of 4 respondents who passed by the pier on both islands were invited to complete the questionnaire. Respondents were approached by the student helpers and were asked to complete the questionnaire independently. The student helpers offered explanations only if they were asked by the respondents to clarify the questions. It took approximately 15 minutes to complete the questionnaire.

<u>Yehliu Geopark & Danxiashan Geopark</u>

On-site questionnaire surveys and field surveys were conducted from the end of June to early July 2017 at the Yehliu Geopark. A questionnaire survey was conducted on two weekends, 24-25 June 2017 and 1-2 July 2017, to obtain an adequate number of visitors. Since the Yehliu Geopark is small and crowded, the doorway of the gate was chosen as the survey site. Four student helpers randomly invited visitors who completed the tour to participate in the survey. On-site questionnaire surveys and field surveys were started in early March 2017 in the Danxiashan Global Geopark. A questionnaire survey was conducted on a weekend, 4-5 March 2017, to obtain an adequate number of visitors. Ten student helpers randomly invited visitors who completed the tour to participate in the survey. Only visitors 18 years old or older were invited to complete the questionnaires.

3.3.3 Statistical analysis

This research adopted SPSS 21 and AMOS 21 to analysis the collected data. The data analysis mainly serves the three main chapters. Descriptive data analysis has been employed to compare the socio-economic characteristics, place attachment, environmentally responsible attitude, geologically responsible behaviour and geopark visitor satisfaction of Chinese geopark visitors in Hong Kong, Taiwan and mainland China. ANOVA and Spearman correlation tests were used to explore the relationship between different constructs and variables. The contingent valuation method is used in Chapter 5 to evaluate the willingness-to-pay of Chinese geopark visitors to support geopark conservation and management.

Finally, structural equation modelling (SEM) was employed to further explore the relationships between constructs in the proposed conceptual framework. Based on the following reasons: 1) this study aims to test the relationship hypothesis in the proposed model, SEM is mostly used for confirming this kind of study design; 2) SEM allowed simultaneous analysis of all the variables in the model instead of separately, which is more effectively with smaller error; 3) SEM analysis data in visual display, which is more concise and easy to interpret. 2) The sample size of this study is large, SEM is more suitable with the consideration of time and money; 3) The proposed model of this study was consisted of multiple variables with complex relationship, SEM can test hypothesis more effectively with smaller error.

After asking the respondents if they were willing to pay, they were asked about the payment amount that they would accept. In this study, the open-ended (OE) question format was selected to inquire about the payment amount. Because the research sites are in Hong Kong, Taiwan and mainland China, it is difficult to design a unified core value quota, payment space or maximum value for the three different places. Thus, it is difficult to use the payment card (PC) format and closed-ended (CE) question format. The questionnaire also investigated the reasons for respondents' reluctance to pay and listed five response options as reasons. To obtain more accurate WTP payment amounts, this study set positive options among the protest options.

Chapter 4: Comparison of the characteristics of Chinese geopark visitors in Hong Kong, Taiwan and Mainland China

4.1 Introduction

The huge market of nearly 1.4 billion people in China and the strong purchasing power of 400 million middle-income individuals can potentially disrupt emerging tourism markets globally, including geo-tourism. In 2016, the number of domestic geopark visitors over the previous three years in China reached 1.62 billion (the People's Daily, 2017). Visiting geoparks is becoming a new trend among Chinese tourists. However, the preferences, attitudes, behaviours and consumption patterns of Chinese visitors have undergone significant changes (McKinsey,2018). In addition, information with regard to visitor profiles can inform the marketing and visitor management strategies of geoparks. Understanding the characteristics of Chinese geopark visitors is vital to improving visitor management and will help minimize negative environmental impacts on invaluable geological resources by formulating regulations and better planning visitor facilities, maximize the economic benefits contributed by Chinese geopark visitors by developing suitable tourism products and routes, and promote earth science and the environmental awareness of the world's largest population.

Over the past 40 years, China has experienced economic reform and opening up policy. China's GDP per capita increased from 366 US dollars in 1992 to 1,053 US dollars in 2001, when the country exceeded 1,000 US dollars per capita for the first time. By 2018, the total economic volume reached 13.6 trillion US dollars, and the country's GDP per capita was

9,770 US dollars, which is close to 10,000 US dollars per capita (DRC, 2019). The growing economic aggregate and income of residents have promoted nationwide consumption, from subsistence consumption to enjoyment consumption and development consumption and from material consumption to service consumption (Nielsen, 2019). In China, the proportion of expenditure on tourism, a main entertainment type of consumption, has been increasing. Statistics from the Ministry of Culture and Tourism (2019) show that the comprehensive contribution of the tourism industry to China's GDP reached 11.05% in 2018. Meanwhile, China's outbound market continued to grow by more than 14.7% in 2018, and the country has been the world's largest spender in outbound tourism since 2012. There were 150 million Chinese outbound tourists in 2018, accounting for more than 10% of total outbound tourists worldwide (UNWTO, 2019). Driven by increasing disposable income, Chinese tourists have sought quality and authentic tourism products instead of sightseeing and shopping (China Tourism Academy & Ctrip, 2019). In this context, the beauty of the geological landscape and resources is being sought by Chinese tourists, and the importance of developing and conserving the geological landscape and its associated resources has been highlighted by both the national government and international organizations.

In February 1999, the United Nations Educational, Scientific and Cultural Organization (UNESCO) proposed the Geoparks Programme, and the new term geopark was officially brought to the public. In 2004, UNESCO established the Global Geoparks Network (GGN), with members being recognized as a UNESCO Global Geopark. Since 2004, the GGN has rapidly expanded to 41 countries and regions with 147 members. There are 39 GGN members in China, accounting for 27% of the total (GGN, 2020). In addition to global geoparks, China has 213 national geoparks approved by the National Ministry of Land and Resources. With both the quantity and quality of geoparks increasing rapidly, destination development and visitor management are urgently needed for both theoretical research and industrial practice. This chapter first focuses on the characteristics of Chinese geopark visitors to develop the profile of such visitors based on their socio-demographic characteristics. Second, this chapter aims to find the similarities and differences in Chinese geopark visitors between Hong Kong, Taiwan and mainland China to explore the characteristics of Chinese geopark visitors under different social conditions in the Greater China Region.

4.2 Respondent profiles

Table 4.1 shows the socio-economic characteristics of Chinese geopark visitors in Hong Kong, Taiwan, and mainland China and their overall characteristics. The gender, age group, educational background, occupation and salary of the respondents were recorded through on-site questionnaire surveys. Based on 894 valid questionnaire surveys, the gender ratio at the three geoparks is fairly close, with approximately 48% being male and 52% being female. Regarding the age group, most respondents are young.

Table 4.1 Comparison of socio-economic characteristics of respondents

		HK Geopark		YL Geopark		DXS Geopark		Overall	
		N	**%**	**N**	**%**	**N**	**%**	**N**	%
Gender	Male	146	48.3	138	47.4	145	48.3	429	48.0
	Female	156	51.7	153	52.6	155	51.7	464	52.0
Age Group	18-25	74	24.5	97	33.3	142	47.7	313	35.1
	26-35	114	37.7	66	22.7	89	29.9	269	30.2
	36-45	60	19.9	63	21.6	31	10.4	154	17.3
	46-55	37	12.3	37	12.7	25	8.4	99	11.1
	56-65	15	5.0	21	7.2	6	2.0	42	4.7
	65 or above	2	0.7	7	2.4	5	1.7	14	1.6
Education	Primary or below	4	1.3	2	0.7	7	2.4	13	1.5
	Secondary school	42	13.9	55	19.0	26	8.8	123	13.9
	Post-secondary	71	23.5	73	25.3	68	23.0	212	23.9
	Undergraduate	146	48.3	115	39.8	168	56.8	429	48.4
	Postgraduate or above	39	12.9	44	15.2	27	9.1	110	12.4
Occupation	Unemployed	5	1.7	0	0.0	11	3.7	16	1.8
	Employed	215	71.2	167	58.0	170	57.4	552	62.3
	Housewife	11	3.6	14	4.9	4	1.4	29	3.3
	Student	59	19.5	77	26.7	96	32.4	232	26.2
	Retired	10	3.3	18	6.3	10	3.4	38	4.3
	Other	2	0.7	12	4.2	5	1.7	19	2.1
Salary	No Income	51	16.9	80	29.2	101	33.9	232	26.5
	Very Low Income	26	8.6	24	8.8	8	2.7	58	6.6
	Low Income	21	7.0	19	6.9	8	2.7	48	5.5
	Middle-low Income	29	9.6	13	4.7	32	10.7	74	8.5
	Middle Income	59	19.5	27	9.9	42	14.1	128	14.6
	Middle-high Income	30	9.9	18	6.6	15	5.0	63	7.2
	High Income	42	13.9	30	10.9	27	9.1	99	11.3
	Very High Income	44	14.6	63	23.0	65	21.8	172	19.7

As shown in Table 4.1, 65.3% of the respondents are young adults between 18 and 35 years old. Approximately 30% are middle-aged people from 36 to 55 years old, and only 6.3%

are elderly people over 55 years old. The respondents at the three geoparks all have very good educational backgrounds. A total of 48.4% of the respondents have an undergraduate degree, and 12.4% had even obtained a postgraduate degree or above. The second largest proportion is the respondents who had had post-secondary education, accounting for 23.9%. Student respondents account for 26.2% of the total sample. At the three geoparks, unemployed individuals, housewives, retired individuals and others are all below 4.3%.

4.2.1 Age Group

The age groups of the respondents are shown in Figure 4.1. At the Hong Kong Geopark, the largest proportion of respondents were young adults between 26 and 35 years old, accounting for 37.7% of the total respondents. The second largest group consisted of young people between 18 and 25 years old, who accounted for 24.5% of the respondents. Middle-aged people aged 36-45 years old accounted for 17.3%, and 12.3% of the respondents were 46 to 55 years old. Very few elderly people visit the Hong Kong Geopark; less than 6% of the respondents were 56 or above.

At the Yehliu Geopark, the largest proportion were also young people, but aged 18 to 25, accounting for 33.3% of the total. Young adults are the second largest proportion at the Yehliu Geopark, accounting for 22.7% of the total, which is equivalent to the number of middle-aged people 36 to 45 years old. Similar to the Hong Kong Geopark, few people above 56 years old visit the Yehliu Geopark in Taiwan, accounting for 9.6% of all visitors.

At the Danxiashan Geopark, the proportion of young visitors aged 18 to 25 years old was much larger than the proportion of other groups, accounting for 47.7% of the total. Nearly 30% of the total were young adults aged 26 to 35 years old. Middle-aged people from 36 to 45 years old accounted for 10.4% of the total, and 8.4% of the total were middle-aged people from 46 to 55 years old. Only 3.7% of the respondents at the Danxiashan Geopark were 56 years old or older.

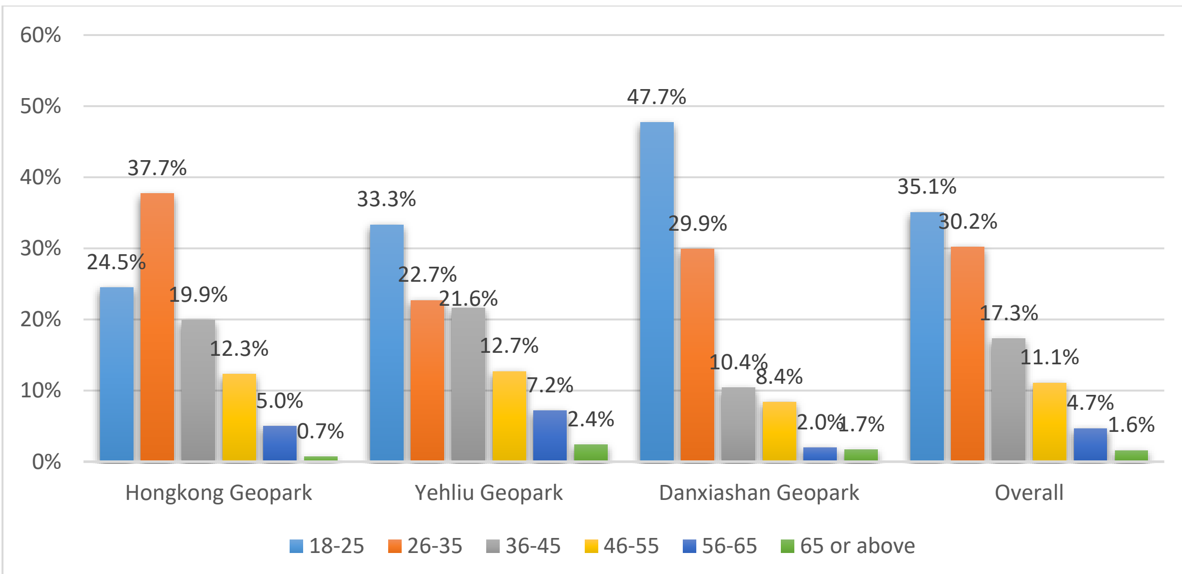

Figure 4.1 Age groups distribution

Figure 4.1shows that the largest proportion at the Yehliu Geopark and Danxiashan Geopark were young people 18 to 25 years old. However, the largest proportion at the Hong Kong Geopark was young adults aged 26 to 35 years old, the number of whom is 1.54 times the number of visitors aged 18 to 25 years old. The results indicate that the visitors at the Yehliu

Geopark and Danxiashan Geopark are younger than those at the Hong Kong Geopark. One of the reasons is that the two geoparks in mainland China and Taiwan are located in comparatively remote areas and visiting requires more travel. Older visitors are less likely to handle the time and effort required, discouraging them from visiting. However, the accessibility of the Hong Kong Geopark is high, and it can be accessed through various modes of public transport that can allow older visitors to reach the geopark easily. In addition, the extensive promotion of geological and environmental education at the geoparks in Taiwan and mainland China may be another reason for the higher number of student visitors.

4.2.2 Educational background

As shown in Figure 4.2, 48.3% of the respondents in Hong Kong have an undergraduate degree. The second largest proportion consists of people who hold a post-secondary diploma, who account for 23.5% of the total. Approximately 14% of the respondents have obtained secondary school education, and 13% respondents have a postgraduate degree or above. Only 1.3% of the respondents have primary education or below.

At the Yehliu Geopark, approximately 40% of the respondents have an undergraduate degree. The second largest proportion consists of people who hold a post-secondary diploma, accounting for 25.3% of the total. Nineteen percent of the respondents have obtained secondary school education, and 15% of respondents have a postgraduate degree or above. Only 0.7% of the respondents have primary education or below.

At the Danxiashan Geopark, 56.8% of the respondents have an undergraduate degree. The second largest proportion consists of people who hold a post-secondary diploma, accounting for 23% of the total. A total of 9.1% of the respondents have a postgraduate degree or above, and approximately 8.8% of the respondents have obtained secondary school education. Only 2.4% of the respondents have primary education or below.

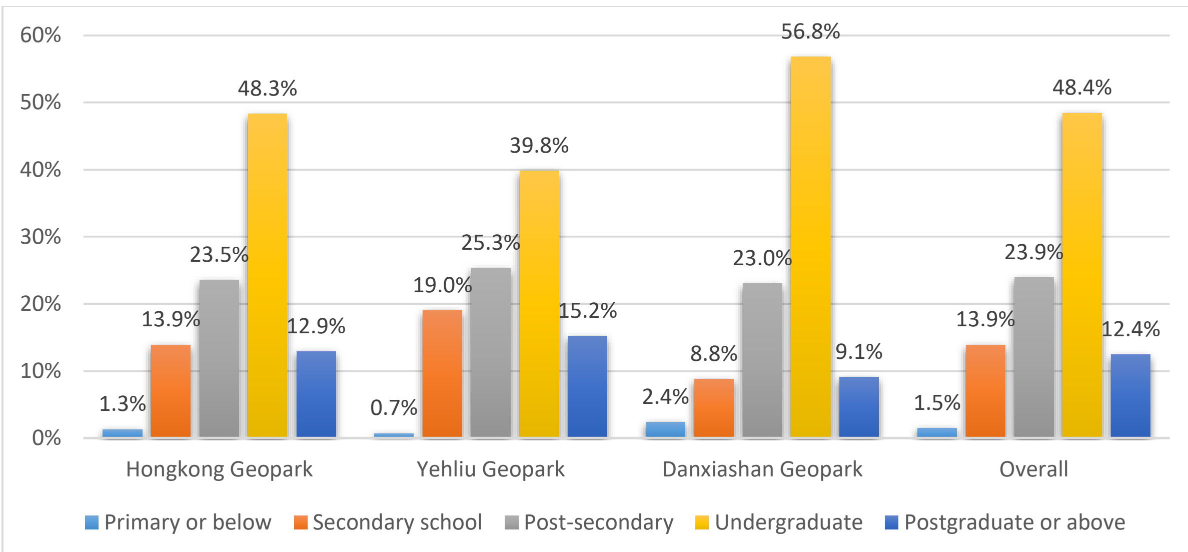

Figure 4.2 Education background

Most respondents at the three geoparks obtained a higher level of education. Over 60% of them received a university degree or above, indicating that the geopark visitors were similar to the ecotourists visiting nature-based destinations in previous studies (Eagles &Cascagnette, 1995; Hvenegaard, 1994; Wight, 1996). Cheung (2016), L. T. O. Cheung and C. Y. Jim (2013) and L. T. O Cheung and L. Fok (2014) reported that visitors at nature-based destinations in Hong Kong had mostly obtained an undergraduate degree or above. A study on Taiwanese ecotourists showed that 73% of respondents had a university degree or above (Tao, Eagles, &Smith, 2004). Similar findings were also identified from previous studies in Western countries (Can, Alaeddinoglu, Turker & Öztürk, 2013). More educated people with richer travel experience are more inclined to explore alternative travel destinations such as geoparks.

4.2.3 Occupation

As shown in Figure 4.3, employed respondents accounted for 71.2% of the total at the Hong Kong Geopark. Students accounted for the second largest proportion, with 19.5% of the total. Together, unemployed individuals, housewives, retired individuals and respondents with other occupations accounted for less than 4% of the total. Similar distributions in occupation were also observed in at the Yehliu and Danxiashan Geoparks.

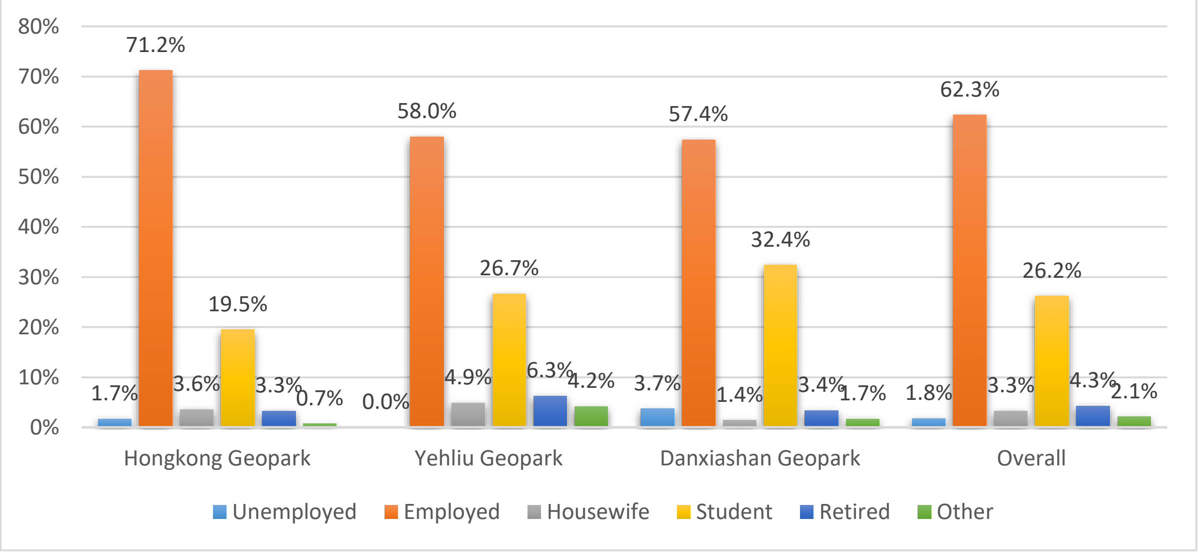

Figure 4.3 Occupation status

At all three study sites, data collection was carried out on weekends when the travel of employed persons would not be affected. More than half of the respondents at the three places were employed. The proportion of students at the Hong Kong Geopark was the lowest, less than 20%, while the employed population was over 70%, corresponding to the 18-25 age group. The Danxiashan Geopark had the largest number of students, more than 30%, and the respondents in the 18-25 age group also accounted for the highest proportion among the three parks.

4.3 Descriptive Statistics of geopark respondent perceptions

4.3.1 Place attachment

Since the identification of people's place attachment in the 1970s, progress has been made in place attachment studies in the field of tourism psychology and sociology. Previous research has suggested that individuals are willing to spend more money and time at a place to which they feel attached (Moore & Graefe, 1994). In addition, place attachment has been identified as the main motivation for re-visiting (Richard, Tom, Sara, et al., 2004). Moreover, the negative sentiment of resources for payment can be eased with an increasing degree of place attachment (Babu & Bibin, 2004). Therefore, the place attachment of Chinese geopark visitors may be an additional influential factor for people's intention to visit geoparks.

In general, the results indicate a mean score of 3.59 for the respondents' place attachment, which indicates that visitors commonly have a mild feeling of attachment to the geopark they visited (Table 4.2). The means of the three geoparks are roughly the same, with the Yehliu Geopark obtaining the highest score of 3.60, followed by the Hong Kong Geopark (3.59).

Table 4.2 Descriptive statistics of place attachment

	Question items of Place Attachment	Hongkong Geopark	Yehliu Geopark	Danxiashan Geopark	Mean
	Cronbach's α	*.875*	*.905*	*.909*	*.897*
P1	Geotourism is meaningful to me.	3.94	4.11	4.15	4.07
P2	I identify strongly with visiting here.	4.04	4.09	4.14	4.09
P3	I am very attached to visiting here.	4.10	4.01	4.08	4.07
P4	I have a special connection to visiting here and other tourists who visit here.	3.54	3.59	3.85	3.66
P5	I enjoy visiting here more than visiting any other place.	3.75	3.52	3.52	3.59
P6	I get more satisfaction visiting here than visiting any other place.	3.76	3.54	3.60	3.63
P7	Visiting here is more important to me than visiting any other place.	3.56	3.43	3.41	3.47
P8	I would not substitute any other type of recreation for what I do here.	3.50	3.12	3.15	3.26
P9	I choose to visit here because the admission fee is not expensive.	3.09	2.92	2.72	2.91
P10	I choose to visit here because the location of the place is convenient	2.75	3.06	3.17	2.99
P11	This destination is the best place for the activities I like to do.	3.73	3.55	3.50	3.59
P12	Visiting this destination makes me feel safe.	3.64	3.74	3.48	3.62
P13	I have a lot of memories in the place.	3.33	3.57	3.32	3.40
P14	I feel a general sense of well-being while visiting this destination.	3.26	3.27	3.18	3.24
P15	Visiting here reminds me of my experiences in the past.	3.21	3.45	3.30	3.32
P16	The place has unique characteristics, such as architecture, historical monuments or particular environment.	4.03	4.35	4.29	4.22

P17	When I am away I miss the place.	3.85	3.94	4.08	3.96
	Mean	3.59	3.60	3.58	3.59

Note: Scale ranged from 1 (strongly disagree) to 5 (strongly agree),(N=894).

Item PA16 obtained the highest mean score, 4.22, among Chinese geopark visitors. The score for PA16 is slightly different among the visitors at the three geoparks, with values of 4.03, 4.35 and 4.29 obtained from visitors at the Hong Kong, Yehliu and Danxiashan Geoparks, respectively. In addition, only 3 indicators scored above 4.00: PA1, PA2, and PA3. The lowest mean score was observed for item PA9 (2.91), which indicated that the respondents were inclined to disagree with the statement "I choose to visit here because the admission fee is not expensive". Hong Kong Geopark visitors scored the highest among the Chinese geopark visitors. This was obviously because visiting the geopark in Hong Kong is free of charge, unlike its counterparts, where admission fees are imposed ($0 for the Hong Kong Geopark, $2.6 for the Yehliu Geopark, and $14.7 for the Danxiashan Geopark).

4.3.2 Environmentally responsible attitude

Among the items (Table 4.5), the second lowest mean score was for PA10 (3.00): "I choose to visit here because the location of the place is convenient". Hong Kong Geopark visitors scored this item the lowest (2.75), followed by visitors at the Yehliu Geopark (3.07). Visitors at the Danxiashan Geopark scored this item the highest (3.17). The reasons visitors at Hong Kong Geopark scored this item the lowest may be due to the relatively inconvenient public transportation. The two sampling sites, Tung Ping Chau and Sharp Island, are located on remote islands where public transport is limited. Visitors have to reach these two islands by ferry, and ferries are usually operated during weekends with only a very limited frequency.

For Chinese geopark visitors, the overall mean of environmentally responsible attitude (ERA) was 3.42 (Table 4.3), and the results indicate that the respondents were inclined to have positive environmentally responsible attitude towards geoparks.

Table 4.3 Descriptive statistic of environmentally responsible attitude

Table 3.1	Question items of Environmentally Resposiable Attitude	Hongkong Geopark	Yehliu Geopark	Danxiashan Geopark	Mean
	Cronbach's α	*.659*	*.719*	*.543*	*.656*
A1	The earth has plenty of natural resources if we just learn how to develop them. **R**	2.31	2.19	2.01	2.17
A2	For the sake of improved leisure opportunities, it is good to develop more recreation area. **R**	2.47	2.73	2.23	2.48
A3	When economic growth is in conflict with environmental conservation, environmental conservation should be given the priority.	4.03	4.42	4.58	4.34
A4	Humans have the right to modify the natural environment to suit their needs. **R**	2.87	3.19	2.88	2.98
A5	Plants and animals have as much right as humans to exist.	4.10	4.46	4.41	4.32
A6	Enjoying natural resources is basic right. It is inappropriate for the government to make laws to control people’s use of natural resources. **R**	2.67	2.91	3.01	2.86
A7	Human beings have the right to satisfy their own needs by altering the natural environment. **R**	3.03	3.36	3.07	3.15

A8	When human beings engage in any leisure and recreational activities, they should avoid disturbing local natural environment.	4.11	4.45	4.28	4.28
A9	The balance of nature is very delicate and easily upset.	3.92	4.44	4.38	4.25
Mean		3.28	3.57	3.43	3.43

Note: Scale ranged from 1 (strongly disagree) to 5 (strongly agree),(N=894).
R: Reversed coding when calculating Mean.

Five items in this section were framed negatively and were reverse-coded to calculate the mean score of the construct. The mean scores of the ERA items with negative wording were relatively low (ERA1=2.17, ERA2=2.47, ERA4=2.98, ERA6=2.87, ERA7=3.16). For these negative statements, only ERA7 had a mean score higher than 3.0. These results indicate that the respondents did not quite agree with items ERA1, ERA2, ERA 4 or ERA6.

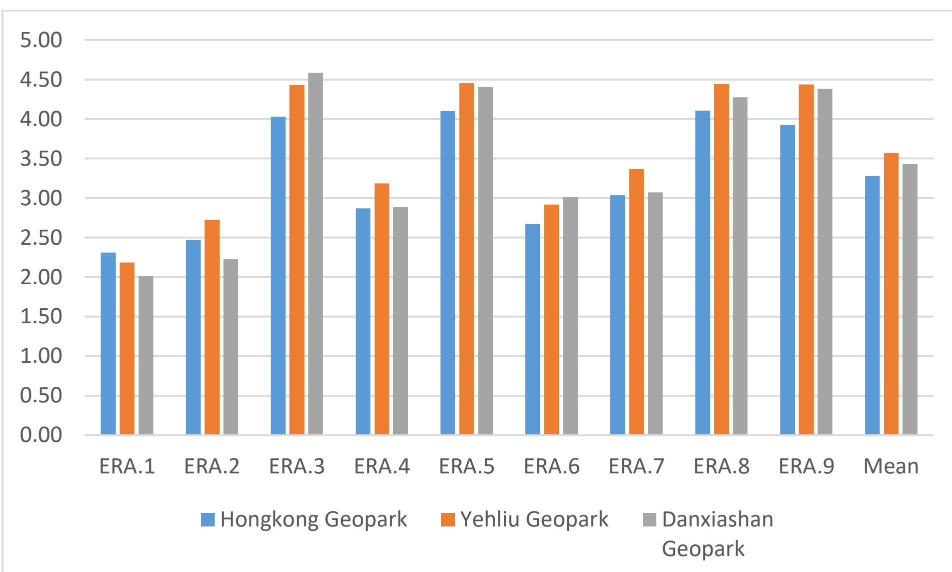

Figure 4.4 Score comparison of Environmentally Responsible Attitude in three geoparks

Regarding the other items, the mean scores were all above 4.0. These results show that the respondents were inclined to agree with the statements, indicating that they commonly have very positive environmentally responsible attitude.

Specifically, for the third item, "When economic development conflicts with environmental conservation, environmental conservation should be given priority", visitors at the Danxiashan Geopark scored higher than visitors in Hong Kong and Taiwan. Among Hong Kong visitors, this item had a mean score of only 4.03 points, while visitors at the Danxiashan Geopark scored it 4.58, and Taiwanese visitors scored it 4.43. Although the Chinese geopark visitor in all regions agree that environmental conservation should be given priority, the visitor inside the Hong Kong Geopark scored slightly lower. These results may relate to there is hardly to see the living communities in Hong Kong Geopark. Therefore, there is no visible contradiction between human beings and the natural environment in the Hong Kong Geopark. So visitors to the Hong Kong Geopark could not feel the urgency of environmental protection. But in Yehliu Geopark, the landmark named the “Queen’s Head” has been widely reported in public media because its neck is becoming thinner year by year due to erosion by wind and rain, and there is a risk of breakage. When the geological landscape presents greater vulnerability, tourists may be more willing to pay to support conservation.

4.3.3 Environmentally responsible behaviour

The overall mean of environmentally responsible behaviour (GRB) was 4.31 (Table 4.4), indicating that people are positively inclined towards pro-environmental behaviour.

Table 4.4 Descriptive statistics of geologically responsible behaviour

	Question items	Hongkong Geopark	Yehliu Geopark	Danxiashan Geopark	Mean
	Cronbach's α	*.865*	*.886*	*.892*	*.893*
B1	I do not take away any rock, fossil or mineral.	4.45	4.84	4.73	4.67
B2	I do not dig up, damage or deface any rocks at this geopark.	4.46	4.87	4.80	4.71
B3	I do not climb the rock columns or trample.	4.07	4.83	4.75	4.54
B4	I try to keep quiet during the trip.	4.37	4.84	4.73	4.64
B5	I try to maintain the local environment quality.	4.46	4.81	4.72	4.67
B6	I try to keep quiet during the trip.	4.00	4.58	4.44	4.34
B7	I try to protect the fauna and flora during my trip.	4.32	4.77	4.72	4.60
B8	I accept the control policy not to enter the core area of the geopark.	4.14	4.69	4.44	4.42
B9	I report to the park administrator if encountering any environmental pollution or destructions.	3.75	4.31	4.14	4.06
B10	I prefer to join in the tours guided by professional and skilled guides if there is any.	3.63	4.08	3.74	3.81
B11	I will share my experience with my friends or family.	4.14	4.39	4.53	4.35
B12	I will encourage my friends or family to join in geopark conservation.	4.04	4.35	4.50	4.30
B13	I will join in voluntary to help the public to learn more about geotourism and geopark.	3.58	3.80	4.04	3.80

B14	I will donate money to support this geopark.	3.36	3.47	3.54	3.46
	Mean	4.05	4.47	4.42	4.31

Note: Scale ranged from 1 (strongly disagree) to 5 (strongly agree),(N=894).

Eleven items obtained high mean scores above 4.0. Chinese geopark visitors disagreed with disruptive behaviours, were willing to conform to the regulations suggested by geopark authorities, and were willing to promote the experience of visiting to their friends and family through their social network. For the items that involved spending time or money, such as GRB10, “I prefer to join tours guided by professional and skilled guides if there are any”, GRB13, “I will join in volunteering to help the public learn more about geo-tourism and geoparks”, and GRB14, “I will donate money to support this geopark”, the respondents tend to give lower scores (mean score is 3.5). The questionnaire results are in line with previous research showing that natured-based tourists generally enjoy and appreciate the conservation of the natural environment (L. T. Cheung & L. Fok, 2014; Alice S.Y. Chow et al., 2019; Juvan & Dolnicar, 2014). Unlike conventional tourists, geopark visitors demonstrate an awareness of environmental conservation and intend to adopt environmentally responsible behaviour. Cheung (2016) and Ma et al. (2018) reported that nature-based tourists who visited national parks in China and geoparks in Hong Kong showed positive attitudes and behaviours towards environmental conservation. Visitors intend to explore the natural environment to acquire knowledge by visiting national parks or geoparks. National park visitors also pay attention to information boards from which they can obtain knowledge about biodiversity and geodiversity. The knowledge acquired during visits to natural areas may enhance their environmental awareness, which is one of the preconditions for adopting environmentally responsible behaviour. The findings on Chinese geopark visitors in this study with regard to participation in guided tours in geoparks somehow contradict those of previous studies by Cheung (2016) and Cheung et al. (2014). Cheung (2016) reported that geopark visitors in Hong Kong enjoyed participating in professional guided geo-tours at the Hong Kong Global Geopark. They were even willing to pay a high price for these tours and supported the conservation of geological resources in the geopark. This divergence from previous studies may be because Chinese geopark visitors are unaware of the availability of guided tour services in these geoparks. In addition, they may only spend a very limited amount of time in such parks, making participation in guided tours infeasible. The high price of good-quality geo-tour guided services could be another reason for the divergent results. For instance, joining a certificated guided geo-tour at the Hong Kong Geopark costs at least HK$380. This may be slightly costly for Chinese geopark visitors; in particular, a large portion of respondents are younger in age and have lower incomes. Items GRB13 and GRB14 are related to volunteering and donating. The two items scored only 3.46 and 3.80, values that were lower than that for GRB12, "I will encourage my friends and family to join in geopark conservation" (4.30). Nature-based visitors tend to be willing to share their travel experience with others. In particular, they like to share their photos of the beautiful environment, landscape and wildlife through their social network (Sarkar, Au, & Law, 2013).

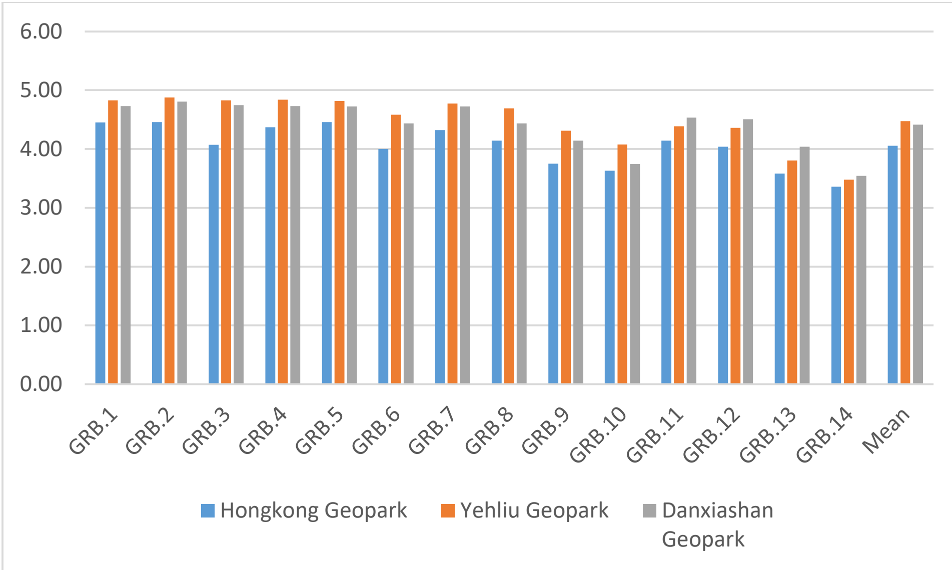

Figure 4.5 Score comparison of Geologically Responsible Behaviour of three geoparks

The scores that the visitors gave to items GRB1 to GRB10 were the highest at the Yehliu Geopark, followed by the Danxiashan Geopark. These results imply that geopark visitors in Taiwan demonstrated a higher level of environmentally responsible behaviours than their counterparts in mainland China and Hong Kong. The visitor management might be better in Yehliu Geopark than in Hong Kong Geopark and Danxiashan Geopark. As the size of the geopark in Taiwan is much smaller, the staff-to-visitor ratio is significantly higher than that at the geoparks in Hong Kong and mainland China. Visitors may therefore behave better to avoid prosecution by the park authority in Taiwan.

For items GRB11-GRB14, visitors at the Danxiashan Geopark scored them higher than their counterparts in Hong Kong and Taiwan. Sharing travel experience is more common in the younger group, as almost half of the respondents at the Danxiashan Geopark were 18-25 years old, almost twice as many as that in Hong Kong and 1.5 times as many as that in Taiwan. Therefore, they may be more willing to share their travel experience on social media.

4.3.4 Visitor Satisfaction

The overall mean score of visitor satisfaction (VS) with the geoparks was 3.85 (Table 4.5), indicating that the respondents were satisfied with the geopark that they visited. Chinese visitors were highly satisfied with the geological features, mountainous areas, scenery and landscape of the geoparks. However, the accessibility of geoparks obtained the lowest score, 3.45, indicating that visitors were not pleased with the public transportation networks. The score for public transportation was particularly low among the visitors in Hong Kong, only 3.48. This may be because the selected sites are located on outlying islands with limited transportation options. Other items, such as those concerning hardware facilities and information announcements, received positive responses from visitors in Taiwan, suggesting that they have good impressions of the hardware facilities at the Yehliu Geopark. Similarly, the comparatively small size of the Yehliu Geopark could facilitate better management and maintenance of the hardware of the park.

Table 4.5 Descriptive Statistics of Visitor Satisfaction

	Question items of Visitor Satisfaction	Hongkong Geopark	Yehliu Geopark	Danxiashan Geopark	Mean
	Cronbach's α	*.908*	*.943*	*.932*	*.931*
S1	Unique geological features	4.21	4.47	4.40	4.36
S2	Attractive mountainous areas	4.19	4.32	4.37	4.29
S3	Diverse species of flora and fauna	3.75	3.86	3.92	3.85
S4	Whole scenery and landscape	4.20	4.20	4.09	4.16
S5	Convenient public transports	3.08	3.65	3.62	3.45
S6	Clear and useful maps of displaying locations	3.73	3.97	3.74	3.81
S7	Clear visiting signposts	3.75	4.05	3.82	3.87
S8	Maintenance of geo trail	3.80	4.16	3.91	3.95
S9	Interesting information board	3.40	3.71	3.50	3.54
S10	Easy access to toilets	3.28	4.00	3.75	3.67
S11	Sufficient security facilities (e.g. parapet, warning signs)	3.60	4.15	3.79	3.84
S12	Sufficient education information about rocks and biological species	3.50	3.88	3.60	3.66
S13	Sufficient recreational facilities (e.g. tables and benches, shelters)	3.43	3.86	3.77	3.68
S14	Sufficient conservation information about rocks and biological species	3.49	3.91	3.65	3.68
S15	Integrated conservation strategy	3.57	3.98	3.68	3.74
S16	Overall satisfaction	3.89	4.14	4.04	4.02
	Mean	3.68	4.02	3.85	3.85

Note: Scale ranged from 1 (strongly disagree) to 5 (strongly agree),(N=894).

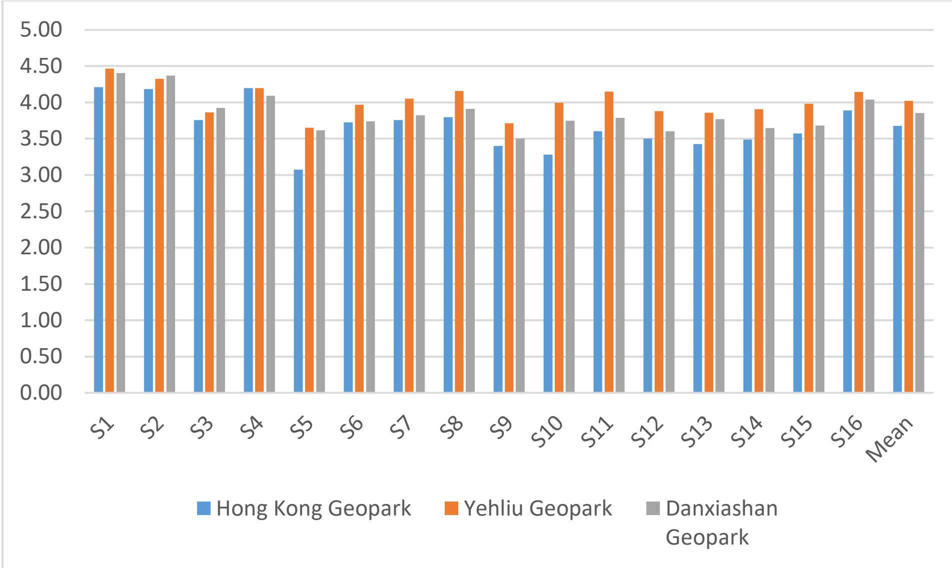

Figure 4.6 Score comparison of Visitor Satisfaction

4.4 Differences between visitors at the geoparks in Taiwan, Hong Kong and mainland China

One-way ANOVA was performed to test the difference in the mean scores between the three study areas. When significant difference is detected, Post Hoc Multiple Comparisons test will be added to do the pairwise comparison to identify the score value order.

The result of ANOVA is shown in Table 4.6, the test detected no difference among the three study areas in place attachment ($p > 0.05$), indicating that visitors of different geoparks in the Greater China Region demonstrated a similar level of attachment to the geoparks they visited. Chinese geopark visitors, particularly non-local geopark visitors, may not consider themselves to have a high sense of belonging to the natural landscape even though such geoparks were designated a global-level natural heritage. Global geoparks, including those in Hong Kong and DXS, are promoted by UNESCO as natural heritage owned by all the people of the world. In addition, visitors may still believe that geological resources are not as important as other types of heritage, such as living things and historical buildings. Previous studies have suggested that visitors are heavily attached to historical buildings and heritage trees or forests, such that they pay great attention to the conservation status of these types of heritage (Cheung & Hui, 2018; Lee, 2011; Vaske & Kobrin, 2001) and are willing to financially support conservation works (Lo & Jim, 2015).

Table 4.6 ANOVA based on all study areas as a whole

		Sum of Squares	df	Mean Square	F	Sig.
PA_Mean	Between Groups	0.051	2	0.025	0.065	0.937
	Within Groups	346.648	891	0.389		
	Total	346.699	893			
ERA_Mean	Between Groups	12.966	2	6.483	20.323	0.000
	Within Groups	284.228	891	0.319		
	Total	297.195	893			
GRB_Mean	Between Groups	31.109	2	15.554	60.623	0.000
	Within Groups	228.608	891	0.257		
	Total	259.717	893			
VS_Mean	Between Groups	17.153	2	8.576	20.786	0.000
	Within Groups	367.631	891	0.413		
	Total	384.784	893			

***Significant at the 0.05 level.

For the other three aspects, including environmentally responsible attitude, geologically responsible behaviour and visitor satisfaction, ANOVA detected significant inter-site differences. In order to distinguish the order of score value, Post Hoc Multiple Comparisons Test need to be processed. The result is shown in Table 4.7, which indicate that the pattern of differences was the same in environmentally responsible attitudes and visitor satisfaction that visitors at the Yehliu Geopark scored the highest, Danxiashan Geopark scored in the middle and Hong Kong Geopark scored the lowest. As for geologically responsible behaviour, visitors in Danxiashan and Yehliu Geopark scored higher than in Hong Kong Geopark, but there is no significant different between Danxiashan Geopark and Yehliu Geopark.

Table 4.7 Post Hoc Multiple Comparisons test in place attachment, environmentally responsible attitude, geologically responsible behaviour and visitor satisfaction

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Place_Mean	HK Geopark	YL Geopark	-0.01048	0.05124	0.838	-0.1110	0.0901
		DXS Geopark	0.00800	0.05080	0.875	-0.0917	0.1077
	YL Geopark	HK Geopark	0.01048	0.05124	0.838	-0.0901	0.1110
		DXS Geopark	0.01848	0.05128	0.719	-0.0822	0.1191
	DXS Geopark	HK Geopark	-0.00800	0.05080	0.875	-0.1077	0.0917
		YL Geopark	-0.01848	0.05128	0.719	-0.1191	0.0822
Atti_Mean	HK Geopark	YL Geopark	-.29575*	0.04640	0.000	-0.3868	-0.2047
		DXS Geopark	-.14932*	0.04600	0.001	-0.2396	-0.0590
	YL Geopark	HK Geopark	.29575*	0.04640	0.000	0.2047	0.3868
		DXS Geopark	.14643*	0.04643	0.002	0.0553	0.2376
	DXS Geopark	HK Geopark	.14932*	0.04600	0.001	0.0590	0.2396
		YL Geopark	-.14643*	0.04643	0.002	-0.2376	-0.0553
Beha_Mean	HK Geopark	YL Geopark	-.42054*	0.04161	0.000	-0.5022	-0.3389

		DXS Geopark	-.36302*	0.04126	0.000	-0.4440	-0.2820
	YL Geopark	HK Geopark	.42054*	0.04161	0.000	0.3389	0.5022
		DXS Geopark	0.05752	0.04164	0.168	-0.0242	0.1392
	DXS Geopark	HK Geopark	.36302*	0.04126	0.000	0.2820	0.4440
		YL Geopark	-0.05752	0.04164	0.168	-0.1392	0.0242
Sati_Mean	HK Geopark	YL Geopark	-.34009*	0.05276	0.000	-0.4437	-0.2365
		DXS Geopark	-.17460*	0.05232	0.001	-0.2773	-0.0719
	YL Geopark	HK Geopark	.34009*	0.05276	0.000	0.2365	0.4437
		DXS Geopark	.16550*	0.05281	0.002	0.0619	0.2691
	DXS Geopark	HK Geopark	.17460*	0.05232	0.001	0.0719	0.2773
		YL Geopark	-.16550*	0.05281	0.002	-0.2691	-0.0619

*. The mean difference is significant at the 0.05 level.

Visitors at the Taiwanese geopark showed a higher level of environmentally responsible attitude and visitor satisfaction than their counterparts in Hong Kong and mainland China (Figure 4.7&Figure 4.9). This may be because education for sustainable development is more successful in the Taiwanese community. The tourist information and promotional materials of the Taiwanese geopark place a heavy emphasis on the sustainable development and conservation of the geopark. This information is directly delivered to the park's visitors, who were more willing to adopt environmentally responsible behaviour and to have positive environmental responsible attitudes when they were in this geologically sensitive destination. Visitors at the Hong Kong Geopark reported the lowest level of environmentally responsible attitude and visitor satisifaction. In general, Hong Kong Geopark currently overlaps the boundary with Hong Kong Country Parks, and visitors to Hong Kong Geopark may somehow be the same as country park visitors. Because Hong

Kong is a highly urbanized place with a small area of 1,106 km², visiting geoparks and country parks could be a routine activity of Hong Kong people. Those visitors may not define themselves as ecotourists or environmental conservationists who adopt a high level of environmental attitudes and behaviours. They are just killing time during weekends, and some studies have reported that for them, one important motive for visiting country parks or geoparks is to spend time in nature-based areas to improve their health (Kondo, South, & Branas, 2015; Maller, Townsend, Pryor, Brown, & St Leger, 2006; van den Bosch & Sang, 2017; Vujcic et al., 2017). Improving health is one of the important motivations of country park visitors in Hong Kong (Cheung, 2016). Therefore, visitors at the Hong Kong Geopark are less environmentally aware than visitors at the geoparks in Taiwan and mainland China.

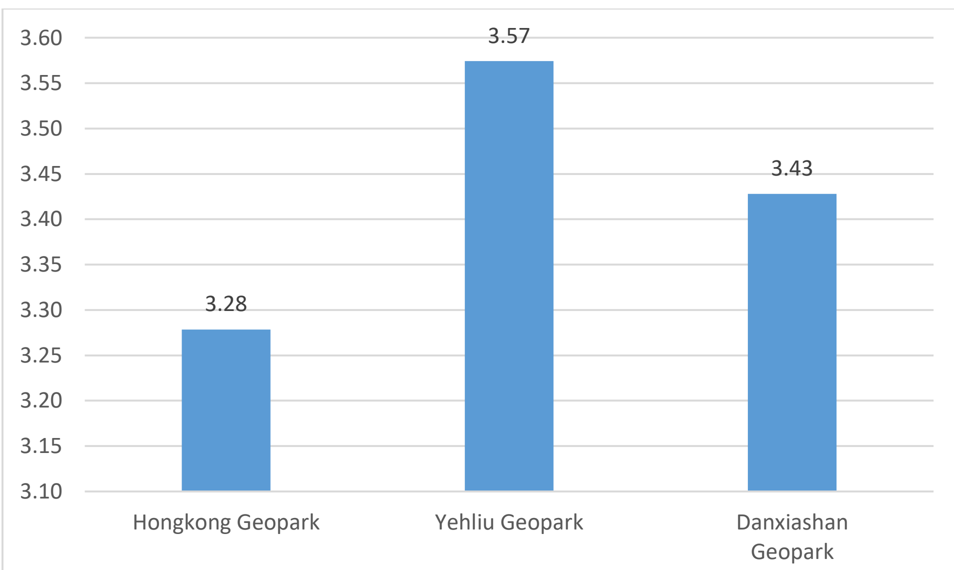

Figure 4.7 The inner-sites differences in Environmentally Responsible Attitude

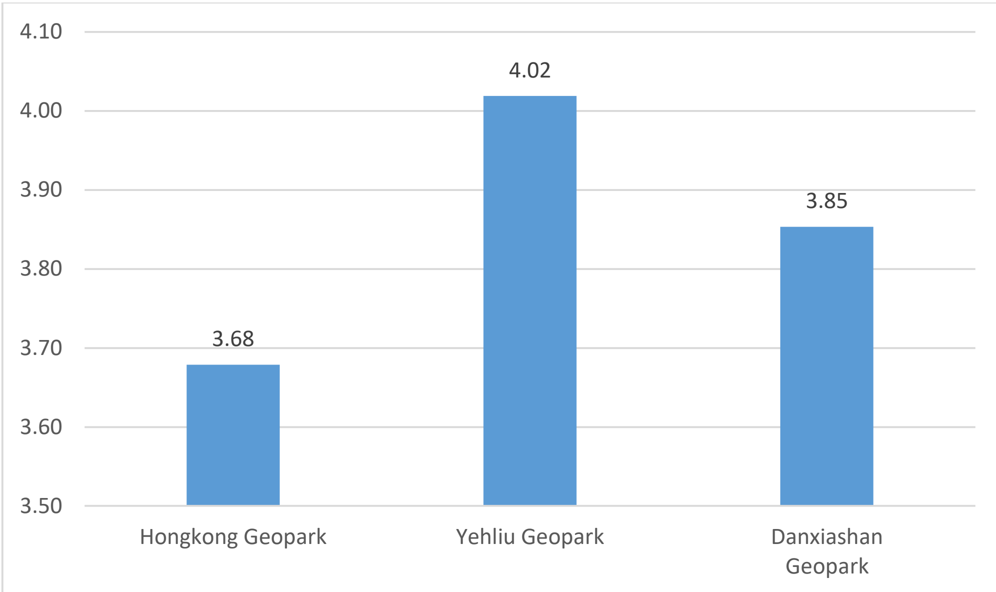

Figure 4.8 The inner-sites differences in Visitor Satisfaction

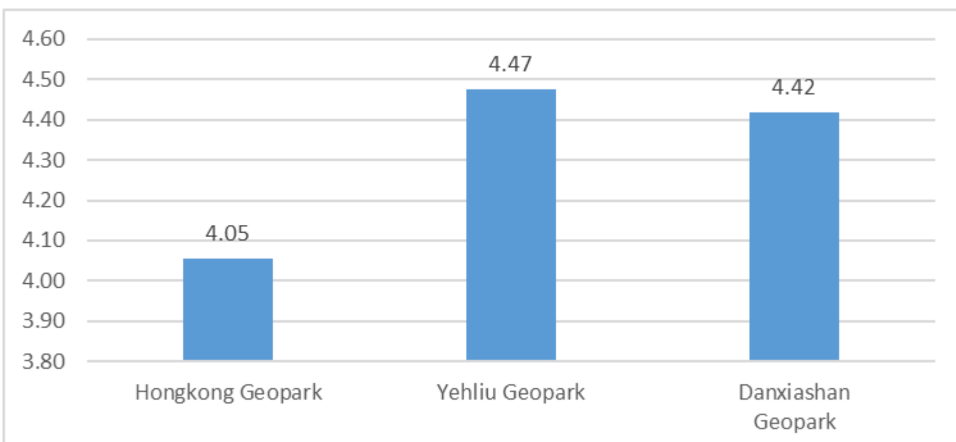

Figure 4.9 The inner-sites differences in Geologically Responsible Behaviour

In terms of visitor satisfaction with the geoparks, a significant difference was found between the visitors at the three geoparks. But only the lowest score value of Hong Kong is detected, there is no significant difference between Yehliu and Mainland China. The pattern of differences was the same as that for the previous two variables in that visitors at the Hong Kong Geopark scored the lowest. Similar reasons may also be applicable, as those visitors to the geopark in Hong Kong may not necessarily be motived by the sense of appreciation for natural beauty. Therefore, they may not offer a fair assessment of their satisfaction with various aspects of the Hong Kong Geopark. Unlike the visitors at the other two geoparks in Taiwan and mainland China, most visitors purposefully visit destinations of geological interest, as reaching a geopark may require travelling a long distance of travelling and admission fees for the visit apply. Therefore, those visitors may be more inclined to adopt environmentally responsible behaviour and be aware of environmental conservation. Similarly, they focus more on the environmental information provided by the parks and are aware of the environmental conservation efforts that have been made by the management authorities.

To conclude, there are differences in various aspects, including the level of environmentally responsible attitude, environmentally responsible behaviour and visitor satisfaction of Chinese geopark visitors, even though all visitors share similar cultural backgrounds. This study suggests that the setting, location, and management effort of a geopark may affect the environmental attitudes and responsible behaviours among its visitors. Better managed geoparks may be able to facilitate better communication with their visitors and hence enhance their opportunities to have a positive attitude towards environmental conservation. In addition, the effort that must be made to reach a geopark can also help in screening out ordinary visitors. Less environmentally aware visitors or those who are not interested in understanding and appreciating geological features will then be eliminated and will not visit highly remote geoparks, which require a long travel time.

Chapter 5: Chinese Visitors' Willingness-to-pay to Support Geopark Management and Conservation

5.1 Introduction

With the rapid expansion of the Global Geoparks Network since 2004, geological resources have attracted an increasing number of visitors. Visiting geoparks has become a new form of nature-based tourism. Not only has increasing the number of visitors generated tourism revenue, but it has also exerted stress on invaluable geological resources and landscapes. On the other hand, geological resources have long been considered priceless; therefore, the costs of their depletion have not been taken into consideration in market exchange, nor have they been accounted for in national products. Little information is available on the economic value of geoparks, as they have been considered non-marketed services. Therefore, estimations of the economic value of geoparks can be used to raise awareness about the cost of their deterioration, and this value can serve as a basis to inform the formulation of management policies.

5.1.1 Economic valuation methods

The main attractions of geoparks are the geological relics located in geo-sites, but at the same time, they also have the attribute of being a "park", providing places for the public to have leisure and recreation. Therefore, the value of geoparks is not only the non-use value of relics but also the use value of parks. There are two general types of economic valuation methods for assessing non-marketed tourism resources, named travel cost method (TCM) and contingent valuation method

(CVM). TCM is an indirect estimation method to derive the value, the value is indirectly estimated by the amount of money spent on travel (Clawson, 1959). Then it is used in a large number of empirical researches. With the in-depth study of TCM, TCM valuation method has been constantly modified and developed to 6 common TCM valuation methods: Zonal Travel Cost Model (ZTCM), Individual Travel Cost Model (ITCM), Gravity Travel Cost Model (GTCM), Hedonic Travel Cost Model (HTCM), Random Utility Model (RUM) and Travel Cost Interval Analysis (TCIA). Although each of these six TCM methods has its advantages and disadvantages and different scope of application, their essence is to get the actual cost of visitors. There are two ways to obtain the actual cost: 1) field surveys (first-hand data); 2) statistics from management or other agencies (second-hand data). Developed countries, especially the United States, the visitor mainly travels by self-driving, which can have converted the distance to cost by a unified standard. Whiling Chinese visitors travel in a variety of modes of transport, calculating the cost of a trip based on distance can be inaccurate. Even to avoid this problem, the following deviations may also occur when using the TCM method: bias of sampling method and time, opportunity cost of time, substitution and cost allocation among multiple destinations.

In short, TCM is a kind of revealed preference approach based on actual observation data, which seems to be more objective than CVM, the stated preference approach based on virtual market. But in practice, the travel cost data used in most TCM studies are determined by the data constructed and transformed by researchers according to statistical survey. It is difficult to avoid subjectivity and uncertainty in the research process of TCM. Therefore, the method of TCM is not suitable for this research as it conducted in China.

5.1.2 Contingent Valuation Method

The Contingent Valuation Method (CVM) is the most widely used method for non-marketed product valuation in environmental economics, and it is also known as the willingness-to-pay method. In the case of a hypothetical scenario, respondents are asked about their willingness-to-pay (WTP) for tourism resource conservation in a certain place or their willingness to accept (WTA) compensation for the reduction in or deterioration of tourism resources.

The CVM is usually adopted to valuate tourism resources for which there is no market exchange. Therefore, it is necessary to create a hypothetical market (see chapter 3). Since the hypothetical market has a great influence on the accuracy of valuation results, it is necessary to present a detailed description to provide sufficient, accurate and realistic information to respondents to ensure that they understand the questions and provide their real WTP.

The size of the sample directly affects the quality of the results. To ensure the quality of CVM sampling results, there must be enough samples. In general, a larger sample size will result in more valid and better-quality estimations. In reality, sample size is determined by the cost of funds, the availability of personnel, and the duration and accuracy requirements of the investigation. The survey can take the form of face-to-face interviews or be conducted via the Internet. As interviews are the most direct and effective way, this study adopts the interview method to collect data.

5.2 Results and discussion

The target respondents of this CVM survey are all Chinese geopark visitors who visited the three designated geoparks in Hong Kong, Taiwan and mainland China. The entire study collected a total of 894 valid responses. For the CVM questionnaire survey, only 880 were valid, which exceeds the minimum number required (340) and has statistical significance.

This chapter explores the statistical results of Chinese geopark visitors' willingness-to-pay, the amount of payment and the reasons why they are unwilling to pay. The latter part of this chapter investigates the association between potential factors, including socio-economic variables, place attachment (PA), environmentally responsible attitude (ERA), environmentally responsible behaviour (GRB), and visitors' WTP.

The statistical results are mostly classified and displayed according to the data collection points, namely, the Danxiashan Geopark, Hong Kong Geopark and Yehliu Geopark. The second part analyses whether or not sociodemographic characteristics, place of residence, place attachment, environmentally responsible attitude and environmentally responsible behaviour affect the WTP rate and WTP value.

5.2.1 Protest responses for Willingness-To-Pay

Among the 880 valid questionnaires, 315 Chinese geopark visitors indicated that they were unwilling to pay to support geopark conservation and management. Of these, only 264 indicated the reasons for their unwillingness-to-pay. As shown in Table 5.1, most respondents (74) refused to pay because "the tickets are too expensive to be accepted", accounting for 28%. A total of 27.7% of respondents believed "the government should pay for us", followed by 25.8% respondents who thought that "this environment belongs to the public, so I don't need to pay". A total of 10.2% of the respondents think designated geoparks are not worth spending money to visit. Finally, 8.3% of respondents provided other reasons. According to the official ticket price, the daily ticket price of the Danxiashan Geopark is US$14.7, and the holiday ticket price is US$17.7. More than half of the respondents think that the ticket price at the Danxiashan Geopark is too high.

Table 5.1 The reasons for unwillingness-to-pay

statements of reasons		N	%
1	This environment belongs to the public, so I don't need to pay.	68	25.8%
2	I don't think this tourist destination is worth spending money to visit.	27	10.2%
3	The government should pay for us.	73	27.7%
4	I don't want to pay because the tickets are too expensive to be accepted.	74	28.0%
5	Other reasons.	22	8.3%
Total		264	100%

Based on the statements of reasons, only option 2, “I don't think this tourist destination is worth spending money to visit”, is not a protest response because visitors believed that the designated geopark hold no value. Thus, these 27 respondents who chose option 2 will also be taken into consideration to calculate the value of WTP.

5.2.2 Willingness-To-Pay of Chinese geopark visitors

The respondents who chose option 2 were classified as willing to pay, and the results are as follows (Table 5.2). A total of 592 Chinese geopark visitors were willing to pay conservation fees for geopark tourism resources, accounting for 67.3%, while 288 respondents were unwilling to pay, accounting for 32.7%.

Table 5.2 Number of Chinese geopark visitors willing and unwilling to pay to support geopark conservation and management

Sites	Willingness-to-pay (WTP)		Not willing to pay (protest response)	
	N	%	N	%
HK	209	69.2	93	30.8
YL	232	83.2	47	16.8
DXS	151	50.5	148	49.5
Total	592	67.3	288	32.7

The results regarding Chinese geopark visitors' willingness-to-pay to support geopark conservation and management are listed in Table 5.2. Over 83% of Chinese geopark visitors at the Yehliu Geopark indicated a willingness-to-pay, followed by 69.2% and 50.5% of their counterparts at the Hong Kong Geopark and Danxiashan Geopark. The chi-square test reported that there is a significant difference at $p < 0.5$ in WTP between these three geoparks, implying that visitors to the Yehliu Geopark have the highest willingness-to-pay to support geopark conservation and management.

This may be because the high publicity regarding the iconic geological features at the Yehliu Geopark triggers the high willingness of visitors to pay for the protection of such geological features. At the Yehliu Geopark, the landmark named the "Queen's Head" has been widely reported in public media because its neck is becoming thinner year by year due to erosion by wind and rain, and there is a risk of breakage. When the geological landscape presents greater vulnerability, tourists may be more willing to pay to support conservation. The need for conservation seems to be less urgent in the geoparks in Hong Kong and mainland China. Thus, Chinese geopark visitors may be more willing to pay for sites that are more vulnerable to damage.

Second, this result may also be related to the environmental education in the geopark. The Hong Kong Geopark and Yehliu Geopark are relatively small, the number of geological relics is relatively small, and there are relatively few attractions to visit. For example, a museum, visitor centres and other environmental education venues are an integral part of a park and can serve as venues to educate more visitors. These visitor centres play a role in offering a better visitor experience and providing environmental education opportunities for visitors, leading to a higher willingness to support geological conservation and geopark management.

In addition, Taiwan was the second region in Asia, after Japan, to legislate environmental education. The Environmental Education Law of Taiwan regulates the public sector, schools, and corporations with a majority of funding from the government, and it requires organizations to designate staff to promote environmental education. From schools to society, there are many environmental education venues and a great deal of information in Taiwan. Therefore, this may also be the reason Taiwanese people are more willing to pay than Hong Kong people. Hong Kong's GDP per capita is much higher than Taiwan's, but the willingness-to-pay of people in Hong Kong is lower than that of people in Taiwan.

5.2.3 Willingness-To-Pay of Chinese geopark visitors

This research uses the payment card approach to ask the respondents to state their preference for their maximum acceptable WTP amount. As shown in Table 5.3, the average amount that 592 respondents are willing to pay is US$21.27 on average, and the median is US$6.41. The highest average is for the Danxiashan Geopark, US$48.27. The average amount of willingness-to-pay is US$12.95 at the Hong Kong Geopark. The Yehliu Geopark obtained the lowest average WTP amount, US$11.2.

Table 5.3 Willingness-To-Pay of Chinese geopark visitors

Site	N	Mean (USD)	Median (USD)
HK Geopark	209	12.95	6.41
YL Geopark	232	11.2	3.29
DXS Geopark	151	48.27	14.49
Overall Chinese Geopark Visitors	592	21.27	6.41

However, the mean value cannot accurately reflect respondents' average amount of willingness-to-pay. The median value is the value that is most commonly used as the WTP value. The median value refers to the payment amount when the cumulative percentage accumulates to 50%. When the payment amount reached $6.41, the cumulative percentage was closest to 50%. Therefore, overall, Chinese geopark visitors' WTP value is $6.41.

The median WTP values of visitors at the Hong Kong, Yehliu and Danxiashan Geoparks are $6.41, $3.29 and $14.49, respectively. To detect the existence of significant inter-site difference and its ordinal relation, One-way ANOVA with Post Hoc Multiple Comparisons test was proceed. The ANOVA results (Table 5.4) proved that there is a significant difference in WTP between Chinese visitors to the geoparks in Hong Kong, Taiwan and mainland China.

Table 5.4 One-way ANOVA analysis in willingness-to-pay

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	150668.885	2	75334.442	10.796	0.000
Within Groups	3921746.339	562	6978.196		
Total	4072415.224	564			

As One-way ANOVA detected significant inter-site differences, Post Hoc test need be used to find the order of the WTP value. The result is shown in the

Table 5.5 that the WTP of visitors in Danxiashan Geopark is higher than Hong Kong and Yehliu Geopark, there is no significance in WTP of Chinese visitors in Hong Kong and Yehliu Geopark.

Table 5.5 Post Hoc Multiple Comparisons Test in Willingness-To-Pay

(I) Site		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
HK Geopark	YL Geopark	1.91480	8.17429	0.815	-14.1411	17.9707
	DXS Geopark	-36.24637*	9.11259	0.000	-54.1453	-18.3475
YL Geopark	HK Geopark	-1.91480	8.17429	0.815	-17.9707	14.1411
	DXS Geopark	-38.16117*	8.90906	0.000	-55.6603	-20.6620
DXS Geopark	HK Geopark	36.24637*	9.11259	0.000	18.3475	54.1453
	YL Geopark	38.16117*	8.90906	0.000	20.6620	55.6603

*. The mean difference is significant at the 0.05 level.

The Danxiashan Geopark is the largest, followed by the Hong Kong Geopark and Yehliu Geopark. The results reflect that visitors are willing to pay higher amounts to visit the larger geopark. But the geopark size is not equal to the scope of visitor activities' range, the length of stay that determines the real range of activities. Duration of stay was asked in questionnaire, the mean length of the say in HK geopark is 0.89 day, in Yehliu Geopark is 0.88 day, in Danxiashan Geopark is 1.83 days.

In addition, the results of the study are inconsistent with "the wealth hypothesis" that WTP should increase along with wealth of a region. Visitors to the geoparks in mainland China, which is relatively less developed, are willing to pay the highest amount. In contrast, Taiwanese and Hong Kong geoparks, which are from high developed areas that are richer than mainland China, are willing to pay much less than visitors to the Danxiashan Geopark. Some scholars believe that environmental awareness and environmentally responsible behaviour have become global phenomena and are not affected by the level of national economic development (Dunlap & Mertig, 1995). Other scholars have found that national economic growth is positively correlated with environmental willingness-to-pay (Gelissen, 2007). Therefore, although mainland China has the lowest GDP per capita, its economy is growing rapidly, and thus, its willingness-to-pay can be higher. The rapid economic development in mainland China also causes environmental degradation. Solving environmental problems will become increasingly important to all visitors' perspective, which may lead to greater public awareness of environmental issues and a greater willingness to support the conservation in backward region.

Table 5.6 Per Capita GDP and its rate of increase in 2019

	Per capita GDP (UDS $)	Rate of increase
Hong Kong [a]	46,455	1.28%
Taiwan [b]	25,909	2.71%
Mainland China [c]	10,276	6.10%

[a] Census and Statistics Department

[b] National Statistics, R.O.C. (Taiwan)

[c] National Bureau of Statistics of China

5.2.4 Association between Willingness-To-Pay and socio-economic variables

To explore the influence of socio-economic variables on the willingness-to-pay of Chinese geopark visitors, Independent-Samples T-test and ANOVA were adopted. In this research, a total of 592 valid questionnaires were collected, and respondents stated their WTP. The results of the association between WTP and other variables are reported as follows.

Table 5.7 Independent-samples t-test between Willingness-To-Pay value with genders

		Levene's Test		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Differenc
WTP_ Value	Equal variances assumed	21.402	0.000	2.700	641	0.007	16.95895	6.28134
	Equal variances not assumed			2.615	341.917	0.009	16.95895	6.48532

The association with WTP and Gender should be test by Independent-Samples T-test, as WTP is continuous variable, gender is nominal variable within 2 groups; the result is that Sig.=0.007< 0.05, significant difference between male and Female (Table 5.7), the WTP value of male geopark visitors is higher than Female with group statistics result according to the Table 5.8.

Table 5.8 Group statistics of genders with Willingness-To-Pay

		Levene's Test		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Differenc
WTP_ Value	Equal variances assumed	21.402	0.000	2.700	641	0.007	16.95895	6.28134
	Equal variances not assumed			2.615	341.917	0.009	16.95895	6.48532

The association of WTP and education, occupation, salary should be tested by ANOVA, as WTP is continuous variable, and the socio-demographic information are all asked to choose a range as nominal variables with more than 2 groups. The result is shown in Table 5.9, Table 5.10 and Table 5.11, there is no significant difference between WTP value with age, education and salary (Sig. > 0.05).

Table 5.9 ANOVA test of Willingness-To-Pay value with age

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22664.202	5	4532.84	0.705	0.62
Within Groups	4083505.42	635	6430.72		
Total	4106169.62	640			

Table 5.10 Table ANOVA test of Willingness-To-Pay value with education

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4436.762	4	1109.19	0.172	0.953
Within Groups	4098472.52	635	6454.29		
Total	4102909.29	639			

Table 5.11 ANOVA test of Wilingness-To-Pay value with salary

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	48676.960	7	6953.851	1.064	0.385
Within Groups	4053265.875	620	6537.526		
Total	4101942.835	627			

The relationship between WTP value and occupation is tested by ANOVA, the result is shown in Table 5.14.There is significant difference between WTP value with occupation. And with Post Hoc Test, there is only significant difference of the other occupation holder' WTP value is higher than housewife, student and retired people.

Table 5.12 ANOVA Test of Willingness-To-Pay value with occupation

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	109928.997	5	21985.799	3.483	0.004
Within Groups	3995516.075	633	6312.032		
Total	4105445.072	638			

Table 5.13 Post Hoc Multiple Comparisons Test between Willingness-To-Pay and Occupation

Occupations			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
LSD	Unemployed	Employed	17.24585	26.77468	0.520	-35.3321	69.8238
		Housewife	27.19696	31.43640	0.387	-34.5353	88.9292
		Student	23.75440	27.21290	0.383	-29.6841	77.1929
		Retired	-9.53441	31.43640	0.762	-71.2667	52.1978
		Other	-48.97657	32.14886	0.128	-112.1079	14.1547
	Employed	Unemployed	-17.24585	26.77468	0.520	-69.8238	35.3321
		Housewife	9.95111	17.39130	0.567	-24.2005	44.1027
		Student	6.50855	7.39946	0.379	-8.0219	21.0390
		Retired	-26.78027	17.39130	0.124	-60.9319	7.3714
		Other	-66.22242*	18.64830	0.000	-102.8424	-29.6024
	Housewife	Unemployed	-27.19696	31.43640	0.387	-88.9292	34.5353
		Employed	-9.95111	17.39130	0.567	-44.1027	24.2005
		Student	-3.44256	18.05867	0.849	-38.9047	32.0196
		Retired	-36.73137	23.95456	0.126	-83.7714	10.3086
		Other	-76.17353*	24.88218	0.002	-125.0351	-27.3119
	Student	Unemployed	-23.75440	27.21290	0.383	-77.1929	29.6841
		Employed	-6.50855	7.39946	0.379	-21.0390	8.0219
		Housewife	3.44256	18.05867	0.849	-32.0196	38.9047
		Retired	-33.28882	18.05867	0.066	-68.7510	2.1733
		Other	-72.73097*	19.27219	0.000	-110.5761	-34.8858
	Retired	Unemployed	9.53441	31.43640	0.762	-52.1978	71.2667
		Employed	26.78027	17.39130	0.124	-7.3714	60.9319
		Housewife	36.73137	23.95456	0.126	-10.3086	83.7714
		Student	33.28882	18.05867	0.066	-2.1733	68.7510
		Other	-39.44216	24.88218	0.113	-88.3038	9.4194
	Other	Unemployed	48.97657	32.14886	0.128	-14.1547	112.1079
		Employed	66.22242*	18.64830	0.000	29.6024	102.8424
		Housewife	76.17353*	24.88218	0.002	27.3119	125.0351

	Student	72.73097*	19.27219	0.000	34.8858	110.5761
	Retired	39.44216	24.88218	0.113	-9.4194	88.3038

*. The mean difference is significant at the 0.05 level.

The results suggest that only the gender and occupation of Chinese geopark visitors indicated significant differences in WTP within groups, implying that different gender groups and occupational backgrounds exhibit various WTP patterns. However, there are no significant linear relationships between any other socio-economic variables and WTP, which contradicts many other previous studies (Chen & Jim, 2012; Cheung et al., 2014; L. T. O. Cheung & L. Fok, 2014). Previous studies have commonly suggested that WTP increases with the increasing salary level and educational level, implying that visitors with a better salary and a higher level of education are willing to pay more to support conservation (Cheung et al., 2014). The research by Cheung (2016) in Hong Kong reported that younger geopark and country park visitors are willing to pay more to support conservation works in nature-based destinations. This may be because younger visitors are equipped with better environmental knowledge and awareness to trigger their supportive attitudes towards environmental conservation. Some Western studies indicate that young people have better environmental attitudes and behaviours (L. T. O. Cheung & L. Fok, 2014; Kentucky Environmental Education Council, 2009; Lee & Moscardo, 2005), especially those under 25 years old, who receive more education and guidance and adopt more pro-environmental behaviours, such as environmental participation and environmental donations. However, the results of this study show that the WTP of Chinese geopark visitors does not correlate with their age. In China, studies have shown that income is not related to people's environmental conservation concepts (Hong, 2013). Young people have more time and energy to receive environmental protection information. However, WTP is also about economic power and is influenced by Confucian culture, and most young people aged 20 to 25 are still students with poor economic ability.

Regarding the gender differences in adopting a more environmentally friendly approach, there is significant difference between males and females in the WTP to support geopark conservation and management in Chinese geopark visitors. And the WTP of male is much higher than female. This largely contradicts many previous studies showing that women are more likely to support environmental conservation regardless of whether through actions or financially (Cheung, 2010; R. E. Dunlap, K. D. Van Liere, A. Mertig, & R. E. Jones, 2000; Gifford & Nilsson, 2014; Vicente-Molina et al., 2013). In addition, the maternal characteristics of females lead them to be concerned about the natural environment, and they may show more empathy with regard to the degradation of the environment and organisms. Most of these findings were from Western countries. Limited studies on gender differences have been performed in the Chinese context. The enhanced status of women in the Western world may be one of the reasons leading to the high WTP to support conservation (Ajzen & Fishbein, 1977; Fisher et al., 2012; Lee et al., 2013). More women are able to earn and be financially independent, such that they are better able to financially support charities. However, unlike many liberal Western countries, the status of women in the Greater China Region may not be as prominent as that in the Western world. The roles of many Chinese women consist of taking care of children (Leskošek, 2011), particularly in mainland China and Taiwan, where women are less financially independent and may not be able to make their own decision on whether or not to support what they think is right.

Many studies show that higher levels of education lead to better environmental awareness and behaviour (Camp & Fraser, 2012; Hines et al., 1987; Jim & Shan, 2013; Vicente-Molina et al., 2013). As the old Chinese saying goes, it is easier to know than to do. High educational levels do not mean higher moral requirements in the public sphere. Regarding the influence of educational level on environmental behaviour, domestic and foreign studies have reached a consensus. As the educational level increases, the public's environmental behaviour will also continue to increase. However, the results of this study show that the amount of visitors' willingness-to-pay in Chinese geoparks is not related to their educational level.

5.2.5 Association between Willingness-To-Pay and other variables

Table 5.5 shows the correlations between WTP and place attachment (PA), environmentally responsible attitude (ERA), environmentally responsible behaviour (GRB) and geopark visitor satisfaction (VS). A Spearman correlation test was employed to explore the relationships between PA, ERA, GRB, VS and visitors’ WTP to support geopark conservation and management. The internal consistency of the four constructs was calculated to ensure their reliability before further statistical analysis. The Cronbach alphas of PA (0.898), ERA (0.643), GRB (0.904) and VS (0.937) were all above 0.6, indicating that they are highly reliable and can be used for further statistical tests.

Table 5.14 Association between Chinese geopark visitors' WTP and other variables

Factors	WTP
Place attachment (PA)	0.086*
Environmentally responsible attitude (ERA)	0.092*
Geopark visitor satisfaction (VS)	0.125**
Environmentally responsible behaviour (GRB)	0.112**

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

The Spearman correlation test results in Table 5.14 suggest that place attachment (PA), environmentally responsible attitude (ERA), geopark visitor satisfaction (VS) and environmentally responsible behaviour (GRB) were positively correlated with the WTP to support geopark conservation and management. Stronger correlations were noted between VS, GRB and WTP than between PA and ERA. The findings are generally supported by previous studies suggesting that people with better environmentally responsible attitude and behaviours support environmentally responsible actions, including financial support for conservation (Aguilar & Vlosky, 2007; Chen & Jim, 2012; Cheung et al., 2014; Kang, Stein, Heo, & Lee, 2012; López-Mosquera & Sánchez, 2014; Lorenzo, Blanche, Qi, & Guidry, 2000; Togridou, Hovardas, & Pantis, 2006).

Visiting geoparks can promote visitors' understanding of the destination. Interpretative boards, museums and guided tours can enhance visitors' environmental and conservation knowledge, allowing them to be more concerned about geopark conservation and management. A sense of belonging to invaluable geological resources can be built up through geopark visits, as visitors can link themselves more closely with the natural environment. A sense place or place attachment has commonly been found to be associated with pro-environmental attitudes and behaviour. Lo and Jim (2015), Cheung and Hui (2018) and Alice S.Y. Chow et al. (2019) studied the relationship between individuals' place attachment and their conservation perceptions of urban forestry and wetlands and suggested that place attachment plays an important role in influencing pro-environmental attitudes towards the natural environment. Similar to place attachment, environmentally responsible attitude and behaviours have also been found to be determinants of willingness-to-pay in the relevant literature (Arin & Kramer, 2002; Baral, Stern, & Bhattarai, 2008; Cheung et al., 2014; López-Mosquera & Sánchez, 2014; Togridou et al., 2006). This is not surprising because visitors with better environmental attitudes and behaviours will provide more financial support for environmental conservation if they have money available. Previous studies have also confirmed that people in many countries are willing to pay a premium to purchase environmentally friendly services and products (Cheung, 2016; Cheung et al., 2014). They would rather pay more to ensure that the services and products that they purchase are not harmful to the environment. In addition, they believe that environmentally friendly products are better for health.

5.3 Conclusion

Exploring the determinants of the willingness-to-pay to support geopark conservation and management can offer managerial insights for geopark authorities to enhance their financial support for park management. This chapter successfully identified the willingness-to-pay pattern of Chinese geopark visitors and various determining factors that influence WTP. Geopark authorities can therefore take this study as a reference to formulate the pricing policy of geopark and to better communicate with geoparks on how the funding from park admission tickets will be used to enhance the conservation and management of the parks. By improving visitors' environmentally responsible attitude and behaviour as well as their satisfaction, visitors will have more intentions to pay higher amounts to support the conservation works of geoparks. Improving the interpretative and experiential learning activities in parks will definitely enhance the visitor experience, which may positively affect visitors' willingness-to-pay, and this may compensate for the financial shortfall of many geoparks all over the world.

Chapter 6: Determinants of environmentally responsible behaviour: A structural equation modeling (SEM) analysis

6.1 Model construction

This chapter assesses the relationships between different factors that may affect environmentally responsible behaviour by using structural equation modelling (SEM). The purpose of adopting SEM in this study is to comprehensively analyze the relationship of all variables in one research framework. So as to effectively implement Sustainable tourism and to promote the environmentally responsible behaviour. The relationships between geopark visitors' place attachment (PA), visitor satisfaction (VS), environmentally responsible attitude (ERA) and environmentally responsible behaviour (GRB) are explored. According to the literature review, the six core hypotheses were developed as follows:

H1: Place attachment directly affects geologically responsible behaviour.

H2: Environmentally responsible attitude directly affects geologically responsible behaviour.

H3: Visitor satisfaction directly affects geologically responsible behaviour.

H4: Place attachment directly affects environmentally responsible attitude.

H5: Visitor satisfaction directly affects environmentally responsible attitude.

H6: Place attachment directly affects visitor satisfaction.

The proposed theoretical framework is shown in Figure 6 to test these hypotheses.

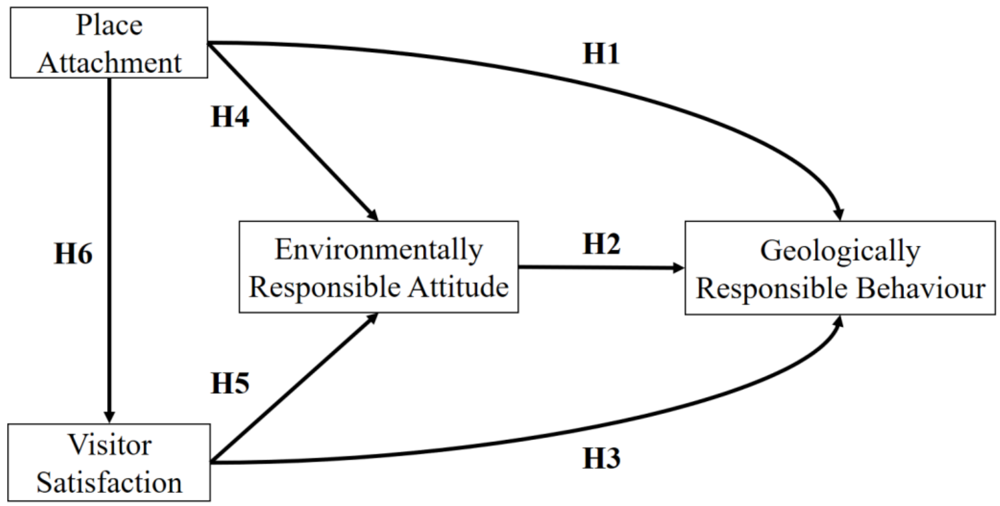

Figure 6.1 Proposed theoretical framework of this study

6.1.1 Initial model

The structural equation model for the proposed theoretical framework was tested by using AMOS 21. The rectangles represent observed variables, and the ovals represent latent variables. There are 4 potential constructs in this study, namely, place attachment, satisfaction, environmentally responsible attitude and environmentally responsible behaviour. The total number of observed variables is 56, i.e., the corresponding 56 items in the questionnaire.

6.1.2 Factor loadings

Before running the SEM analysis, reliability analysis was carried out in Chapter 4. SPSS was used to test the reliability of the 56 items across the four constructs. The Cronbach's alpha values were

0.897 (PL), 0.656 (ERA) and 0.893 (GRB), 0.931 (VS), greater than 0.6, indicating that the variables in the questionnaire can be used for factor analysis (Table 6.1).

Table 6.1 Factor loading for 4 times

Variables		1st	2nd	3rd	4th
Place attachment					
P1	Geotourism is meaningful to me[a]	0.55			
P2	I identify strongly with visiting here[a3]	0.63	0.61	0.59	
P3	I am very attached to visiting here.	0.68	0.69	0.67	0.62
P4	I have a special connection to visiting here and other tourists who visit here[a1]	0.59			
P5	I enjoy visiting here more than visiting any other place.	0.74	0.80	0.81	0.81
P6	I get more satisfaction visiting here than visiting any other place.	0.76	0.84	0.85	0.87
P7	Visiting here is more important to me than visiting any other place.	0.73	0.78	0.78	0.79
P8	I would not substitute any other type of recreation for what I do here.	0.64	0.65	0.64	0.65
P9	I choose to visit here because the admission fee is not expensive.[a1]	0.38			
P10	I choose to visit here because the location of the place is convenient.[a1]	0.42			
P11	This destination is the best place for the activities I like to do.[a1]	0.57			
P12	Visiting this destination makes me feel safe[a1]	0.57			
P13	I have a lot of memories in the place[a1]	0.56			
P14	I feel a general sense of well-being while visiting this destination[a2]	0.64	0.55		
P15	Visiting here reminds me of my experiences in the past[a1]	0.52			
P16	The place has unique characteristics, such as architecture, historical monuments or particular environment[a1]	0.40			
P17	When I am away I miss the plac.[a2]	0.63	0.57		
Environmentally responsible attitude					
A1	The earth has plenty of natural resources if we just learn how to develop them. *R*[a1]	-0.31			
A2	For the sake of improved leisure opportunities, it is good to develop more recreation area. *R*[a2]	-0.21			

A3	When economic growth is in conflict with environmental conservation, environmental conservation should be given the priority.	0.61	0.60	0.60	0.60
A4	Humans have the right to modify the natural environment to suit their needs. *R*[a1]	-0.01			
A5	Plants and animals have as much right as humans to exist.	0.66	0.65	0.65	0.65
A6	Enjoying natural resources is basic right. It is inappropriate for the government to make laws to control people's use of natural resources. *R*[a1]	-0.11			
A7	Human beings have the right to satisfy their own needs by altering the natural environment. *R*[a1]	0.01			
A8	When human beings engage in any leisure and recreational activities, they should avoid disturbing local natural environment.	0.67	0.69	0.69	0.69
A9	The balance of nature is very delicate and easily upset.	0.71	0.74	0.74	0.74
Geographically responsible behaviour					
B1	I do not take away any rock, fossil or mineral.	0.74	0.79	0.81	0.81
B2	I do not dig up, damage or deface any rocks at this geopark.	0.80	0.84	0.86	0.86
B3	I do not climb the rock columns or trample.	0.67	0.68	0.69	0.69
B4	I try to keep quiet during the trip.	0.76	0.79	0.80	0.80
B5	I try to maintain the local environment quality.	0.81	0.82	0.82	0.82
B6	I try to keep quiet during the trip.	0.65	0.62	0.60	0.60
B7	I try to protect the fauna and flora during my trip.	0.80	0.79	0.77	0.77
B8	I accept the control policy not to enter the core area of the geopark.[a2]	0.60	0.57		
B9	I report to the park administrator if encountering any environmental pollution or destructions.[a1]	0.58			
B10	I prefer to join in the tours guided by professional and skilled guides if there is any.[a1]	0.39			
B11	I will share my experience with my friends or family.[a1]	0.59			
B12	I will encourage my friends or family to join in geopark conservation.[a2]	0.65	0.57		
B13	I will join in voluntary to help the public to learn more about geotourism and geopark.[a1]	0.42			
B14	I will donate money to support this geopark.[a1]	0.33			
Visitor Satisfaction					
S1	Unique geological features.[a1]	0.49			
S2	Attractive mountainous areas.[a1]	0.54			
S3	Diverse species of flora and fauna.[a1]	0.58			
S4	Whole scenery and landscape.[a1]	0.58			

S5	Convenient public transports.[a1]	0.57			
S6	Clear and useful maps of displaying locations.	0.72	0.70	0.70	0.70
S7	Clear visiting signposts.	0.73	0.71	0.71	0.71
S8	Maintenance of geo trail.	0.68	0.67	0.67	0.67
S9	Interesting information board.	0.75	0.75	0.75	0.75
S10	Easy access to toilets.	0.66	0.67	0.67	0.67
S11	Sufficient security facilities (e.g. parapet, warning signs).	0.68	0.69	0.69	0.69
S12	Sufficient education information about rocks and biological species.	0.79	0.81	0.81	0.81
S13	Sufficient recreational facilities (e.g. tables and benches, shelters).	0.75	0.76	0.76	0.76
S14	Sufficient conservation information about rocks and biological species.	0.81	0.83	0.83	0.83
S15	Integrated conservation strategy.	0.79	0.80	0.80	0.80
S16	Overall satisfaction.	0.70	0.68	0.68	0.68

R, reversed coding.

[a1] Items have been excluded after the 1st time of the factor loading were below 0.6.

[a2] Items have been excluded after the 2nd time of the factor loading were below 0.6.

[a3] Items have been excluded after the 3rd time of the factor loading were below 0.6.

In Table 6.1, AMOS 21 was adopted to conduct factor analyses. The results of the factor analyses show a high correlation coefficient for all 56 questionnaire items, with only 5 items below 0.3, but the CFI could not reach 0.9. Therefore, items with values below 0.6 were deleted, and a total of 29 items were deleted to ensure the internal consistency of the constructs. The CFI of the structural model can reach the threshold of 0.9.

In this chapter, nearly half of the items were deleted. Apart from the relevance of specific content of the items, it is also possible that the large sample size increases the probability of rejection. From the calculation formula of the chi-square fitting index ((N-1) *F, N is the sample size, and F is the minimum fitting function of the model covariance matrix and the sample covariance matrix.

It can be seen that the larger the sample, the greater the likelihood that the model will be rejected. The chi-square fitting index is also very sensitive for rejecting the assumption of multivariate normality. In this study, the sample size is relatively large, with 879 valid questionnaires. Therefore, 29 question items need to be deleted to achieve a better index to support model fitness.

6.2 Empirical Test of the Model

In this study, one geopark in Hong Kong, one geopark in Taiwan and one geopark in mainland China were selected as the research areas, and a total of 894 valid questionnaires were collected. In this chapter, AMOS 21 is first used to carry out confirmatory factor analysis to test the rationality of the scale composition fitness index. Then, path analysis is carried out. Finally, structural equation modelling of Chinese geopark visitors' environmentally responsible behaviour was performed to explore the relationships between the constructs.

6.2.1 Confirmatory factor analysis

Confirmatory factor analysis (CFA) is used to judge the fitting ability of the initial model to actual data, and it is often used to test the rationality of the construct validity of a scale. When AMOS 21 software is used for CFA, the main indexes for judging the fitness of the model include the following:

- CFI (comparative fit index): The comparative fit index has a value between 0 and 1. When the value is greater than 0.9, the model is acceptable.

- χ 2/df: This is called the relative chi-square value. A value greater than 10 indicates that the model is not ideal, a value less than 5 indicates that the model is acceptable, and a value less than 3 indicates that the model is better (Bentler, 1990; Fan, Thompson, & Wang, 1999).
- GFI (goodness of fit index): This index ranges from 0 to 1. To accept the model, the GFI should be equal to or greater than 0.85.
- NFI (normed fit index): The specification adaptation index is an increase value adaptation measurement. The general recommended value of an acceptable model is above 0.85.
- RMSA (root mean square error of approximation): This is a model adaptation index that has received considerable attention in recent years. When the RMSEA is less than or equal to 0.05, it means a very good fit, the range of 0.05-0.08 indicates a good fit, a moderate fit is in the range of 0.08-0.1, and a bad fit is in the range of more than 0.1.

The structural model of this study is evaluated based on the above indexes (Table 6.2).

Table 6.2 The fitness indexes of the proposed structural model of this study

	CFI	GFI	NFI	RMSEA	P	CMIN/DF
Default model	0.905	0.873	0.885	0.068	0.000	5.087

As indicated in Table 6.2, the CMIN/DF ratio is 5.087, which is very close to 5. The CFI is greater than 0.9, and the GFI and NFI are both greater than the threshold of 0.85, indicating that the model is acceptable with good fit. The RMSEA is 0.068, less than 0.08, which is a good fit. P is equal to 0, and the model is acceptable. In summary, several fit indexes all confirm the model fitness of the current proposed structural model. It can be considered that the model has a good fit and can be used for path analysis.

6.2.2 Correlation between constructs

Correlation Analysis

Only when the correlation analysis between two variables shows a significant correlation can SEM analysis be carried out. Therefore, before the structural equation modelling test, correlation analysis was performed to explore the relationships between place attachment (PA), visitor satisfaction (VS), environmentally responsible attitude (ERA) and environmentally responsible behaviour (GRB). The results of the correlation analysis are shown in Table 6.3. There is a significant correlation between each factor. Therefore, structural equation modelling can be used to test the hypothetical theoretical model in this study.

Table 6.3 Correlation analysis results of the latent variables

	PA	ERA	GRB	VS
PA	1	-.104**	.385**	.512**
ERA		1	.178**	0.002
GRB			1	.478**
VS				1

**. Correlation is significant at the 0.01 level (2-tailed).

<u>Structural equation model</u>

In this study, 0.6 was used as the critical value of the discrimination index, and 29 items were deleted, with 27 observed variables remaining. The remaining items are grouped into 4 constructs with a total of 27 items, as shown in Table 3.1Table 6.4. Five items were used to measure place attachment (PA), 11 items were used to measure geopark visitor satisfaction (VS), 4 items were used to measure environmentally responsible attitude (ERA), and 7 items were used to measure environmentally responsible behaviour (GRB). The items in the measurement scale are taken as composite variables for further analysis. The composite reliability (CR) values of PA, ERA, GRB and VS are 0.836, 0.758, 0.899 and 0.938, respectively. Although a CR value greater than 0.6 is considered acceptable, Hair (1997) thinks that 0.7 is the acceptable threshold. In addition, the standard AVE value suggested by Fornell and Larcker (1981) should be approximately 0.5. Therefore, the data show that the model has high reliability.

Table 6.4 Factor loadings, average variance extracted (AVE) and composite reliability (CR) of the SEM model

Variables		Range	Mean	Factor loading	Average variance extracted	Composite reliability
Place attachment			3.59		0.51	0.836
P3	I am very attached to this place.	1-5	4.07	0.68		
P5	I enjoy visiting this place more than visiting any other place.	1-5	3.59	0.74		
P6	I receive more satisfaction this place than visiting any other place.	1-5	3.63	0.76		
P7	Visiting this place is more important to me than visiting any other place.	1-5	3.47	0.73		

P8	I would not substitute any other type of recreation for what I do here.	1-5	3.26	0.64		
Environmentally responsible attitude			3.43		0.44	0.758
A3	When economic growth is in conflict with environmental conservation, environmental conservation should be given priority.	1-5	4.34	0.61		
A5	Plants and animals have as much right as humans to exist.	1-5	4.32	0.66		
A8	When human beings engage in any leisure and recreational activities, they should avoid disturbing the local natural environment.	1-5	4.28	0.67		
A9	The balance of nature is very delicate and easily upset.	1-5	4.25	0.71		
Environmentally responsible behaviour			4.60		0.56	0.899
B1	I do not take any rocks, fossils or minerals.	1-5	4.67	0.74		
B2	I do not dig up, damage or deface any rocks at this geopark.	1-5	4.71	0.80		
B3	I do not climb the rock columns or trample.	1-5	4.54	0.67		
B4	I try to keep quiet during the trip.	1-5	4.64	0.76		
B5	I try to maintain the quality of the local environment.	1-5	4.67	0.81		
B6	I take all my clutter and garbage.	1-5	4.34	0.65		
B7	I try to protect the fauna and flora during my trip.	1-5	4.60	0.80		
Visitor satisfaction			3.77		0.54	0.928
S6	Clear and useful maps that display locations.	1-5	3.81	0.72		
S7	Clear visiting signposts.	1-5	3.87	0.73		
S8	Maintenance of geo-trails.	1-5	3.95	0.68		
S9	Interesting information board.	1-5	3.54	0.75		
S10	Easy access to toilets.	1-5	3.67	0.66		
S11	Sufficient security facilities (e.g., parapets, warning signs).	1-5	3.84	0.68		
S12	Sufficient educational information about rocks and biological	1-5	3.66	0.79		

	species.			
S13	Sufficient recreational facilities (e.g., tables and benches, shelters).	1-5	3.68	0.75
S14	Sufficient conservation information about rocks and biological species.	1-5	3.68	0.81
S15	Integrated conservation strategy.	1-5	3.74	0.79
S16	Overall satisfaction.	1-5	4.02	0.70

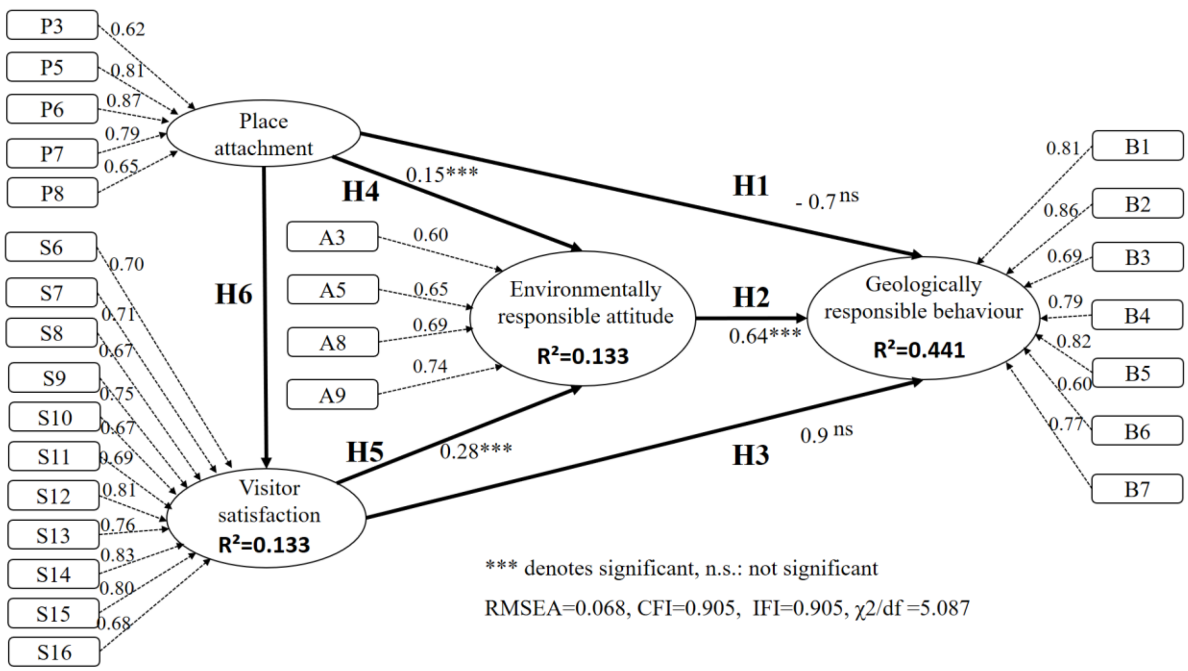

Figure 6.2 The structural model of Place Attachment, Environmentally Responsible Attitude, Geologically Responsible Behaviour, and Visitor Satisfaction

Table 6.5 Summarized results of the path analysis

		Estimate	S.E.	C.R.	P
H1	PA-->GRB	-0.055	0.026	-2.111	.044
H2	ERA-->GRB	0.534	0.037	14.253	***
H3	Satisfaction-->GRB	0.072	0.037	1.935	.008
H6	PA-->ERA	0.14	0.039	3.643	***
H7	Satisfaction-->ERA	0.349	0.055	6.311	***
H8	PA-->Satisfaction	0.251	0.028	8.893	***

A structural equation model is constructed to explore the relationships between latent variables and observed variables. As shown in Fig. 6.3, place attachment (PA), geopark visitor satisfaction (VS), and environmentally responsible attitude (ERA) are independent variables, and environmentally responsible behaviour (GRB) is the dependent variable. The SEM-based path analysis suggests that place attachment (PA) and geopark visitor satisfaction (VS) have a significant positive correlation with environmentally responsible attitude (ERA), implying that visitors' higher attachment to geoparks leads to a better level of environmentally responsible attitude. Similarly, visitors who are more satisfied with their geopark visiting experience exhibit a higher level of environmentally responsible attitude (ERB). However, neither PA nor ERA indicate a significant association with environmentally responsible behaviour (GRB). Regarding the influence of environmentally responsible attitude (ERA) on environmentally responsible behaviour (GRB), the results of the path analysis suggest that ERA is positively correlated with GRB, meaning that the higher the environmentally responsible attitude of geopark visitors are, the higher their intention to adopt environmentally responsible behaviour. Although the results of path analysis suggest that PA and VS do not have a direct association with GRB, the indirectly positive relationship with GRB, with ERA as the mediator, is supported.

Based on the SEM results (Table 6.4 and Figure 6.3), H2, H6, H7 and H8 are supported, and H1 and H3 are rejected. Specifically, H1 is rejected; that is, place attachment cannot directly affect environmentally responsible behaviour. H3 is rejected; that is, visitor satisfaction does not directly affect environmentally responsible behaviour. H2 is supported; that is, environmentally responsible attitude directly affects environmentally responsible behaviour. H4 is supported; that is, place attachment directly affects environmentally responsible attitude. H5 is supported; that is, visitor satisfaction directly affects environmentally responsible attitude. Finally, H6 is supported; that is, place attachment directly affects visitor satisfaction.

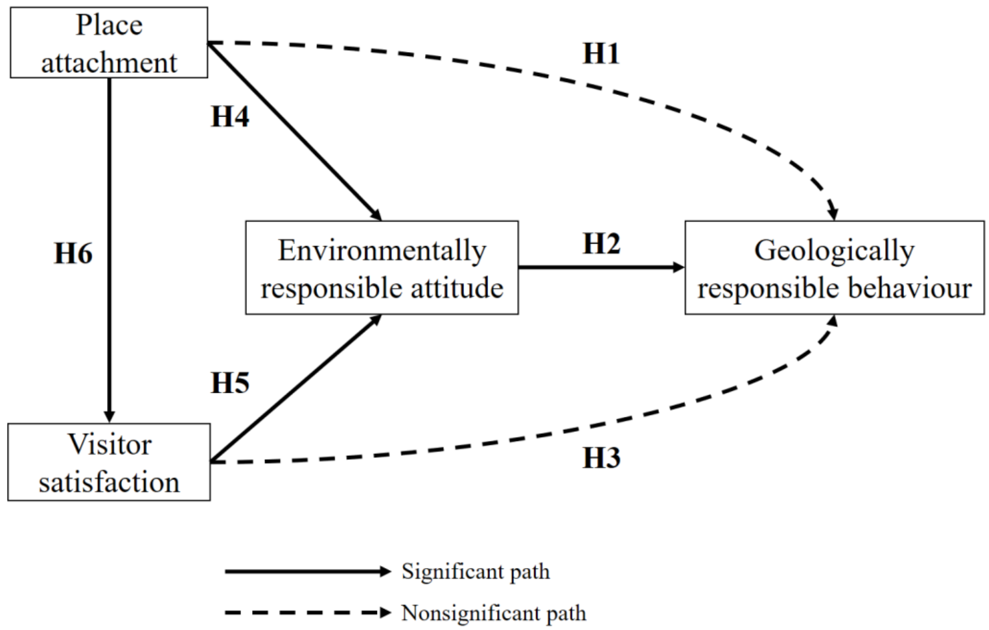

Figure 6.3 Observed relationships between Place Attachment, Environmentally Responsible Attitude, Geologically Responsible Behaviour, and Visitor Satisfaction

6.3 Discussion and conclusion

The SEM results confirmed the validity of the proposed theoretical framework, indicating that environmentally responsible attitude (ERA) positively correlated with environmentally responsible behaviour (GRB), which is generally supported by many previous studies (Ajzen, 2005; Cheung, Lo, et al., 2017; Jackson et al., 2016; Kaiser, 1996; Lee & Jan, 2015; Petrolia, Interis, & Hwang, 2014). This is not surprising because geopark visitors with higher levels of environmentally responsible attitude are more likely to adopt positive behaviour in regard to the conservation of the geological resources in geoparks, as most of them are aware that they are obligated to conserve natural resources and are willing to take pro-environmentally responsible action. However, some previous research findings suggested that good environmental attitudes do not directly translate into pro-environmental behaviour (Kollmuss & Agyeman, 2002; Lee et al., 2013; Valkila & Saari, 2013), as the findings of previous studies have argued that many other factors may be motives that encourage an individual to adopt pro-environmentally responsible behaviour, such as economic incentives (Cheung, Chow, et al., 2017; Webb et al., 2013) and motivations (Cheung, 2016; Alice S. Y. Chow, Irene N. Y. Cheng, et al., 2019; Ma et al., 2018). R. E. Dunlap et al. (2000) suggested that environmental attitudes also do not directly translate into pro-environmentally friendly behaviour. An individual has to enhance his or her pro-environmental intention before adopting pro-environmentally responsible behaviour. They believe that there is a process for nurturing an individual to consistently adopt environmentally responsible behaviour (Dunlap & Jones, 2002; Luo & Deng, 2008). Cheung, Chow, et al. (2017) suggested that economic incentives were an important factor in facilitating the adoption of pro-environmental behaviour for household energy saving. Peer influence has also been discussed as an important factor that enhances the likelihood of park visitors adopting pro-environmental behaviour (Buckley et al., 2017; de Groot & Steg, 2010). By taking pro-environmental actions, such as picking up rubbish along a hiking trail, some visitors can serve as a role model for other visitors to discourage them from doing something wrong to the environment. However, Chinese nature-based tourists were found to be comparatively passive when they identified the misbehaviour of other visitors in a park. They are usually ignored and seldom take further interventions to stop such behaviour or to report it to the relevant authority (Cheung, Lo, et al., 2017).

The findings of this chapter show that place attachment (PA) and geopark visitor satisfaction (VS) are not correlated with environmentally responsible behaviour (GRB). These findings contradict other previous studies that suggested that place attachment is positively correlated with pro-environmental behaviour (Cheng & Wu, 2015; Alice S.Y. Chow et al., 2019; Ramkissoon et al., 2012) and that visitor satisfaction affects pro-environmental behaviour (Chow, Liu, & Cheung, 2019). However, both PA and VS indicate a positive correlation with environmentally responsible attitude (ERA), allowing ERA to act as a mediator linking PA and VS with GRB. This may be because both place attachment and visitor satisfaction need to be built up through longer amounts of time spent in the geoparks that visitors have visited. Visiting geoparks can enhance visitors' understanding of the importance of geoheritage and their awareness of geoconservation to nurture their environmentally responsible attitude towards geoparks (Alice S.Y. Chow et al., 2019). Visiting geoparks can not only provide an opportunity for visitors to learn geological knowledge but also establish a linking relationship between visitors and invaluable geological resources. This can equip visitors with a sense of belonging to the geological heritage and trigger their concern for the conservation of these resources in geoparks (Cheung & Hui, 2018).

This study further confirms that place attachment, satisfaction, and environmentally responsible attitude play an influential role in environmentally responsible behaviour. The findings can be useful for geopark managers to improve the visitor services in their geoparks. Visitor activities such as a good-quality guided tours can be important for offering an experiential learning opportunity for visitors. Visitors can gain geological knowledge and be nurtured to be environmentally friendly aware geopark visitors. In addition, good-quality informational materials, including interpretation boards, leaflets and promotion materials, play a similarly important role in enhancing awareness for those visitors who do not participate in guided tours (Cheng et al., 2018). Accurate environmental knowledge together with conservation messages are essential for disseminating environmental conservation concepts and messages to visitors. A Better visitor experience can simultaneously improve visitors' experience, satisfaction and sense of belonging, which can ultimately lead to environmentally responsible attitude.

Chapter 7: Conclusion

7.1 Introduction

With the rapid development of China's economy, Chinese people's demand for tourism is increasing. Domestic tourism is booming, and the number of outbound tourists now ranks highest in the world. Popular tourism destinations play a particularly important role during long holidays in China. Since 2004, with the rapid expansion of the global geopark network, the geopark system has rapidly developed in the Greater China Region. An increasing number of Chinese tourists now visit geoparks. However, this increasing number of visitors has not only generated tourism revenue but also introduced environmental stresses upon the invaluable geological resources and natural landscapes. Increasing numbers of conflicts have been observed in geoparks in China and overseas due to improper tourists behaviours. Therefore, this research studied Chinese geopark visitors in Hong Kong, Taiwan and mainland China to gain a better understanding of the environmentally responsible behaviours of Chinese geopark visitors and their influencing factors with the goal of formulating appropriate strategies for geopark management and conservation.

7.2 Research Findings

7.2.1 Respondents' profiles

Based on 894 valid questionnaires acquired from Hong Kong, Taiwan and mainland China, the socio-economic information of Chinese Geopark visitors is profiled in Chapter 4 of this research. Chinese geopark visitors are generally, characterized by younger ages and higher education and income. This result is similar to the profiles of ecotourists, responsible tourists and wildlife-watching tourists (Budeanu, 2007; Caruana, Glozer, Crane, & McCabe, 2014; L. T. Cheung & L.

Fok, 2014; Cheung, Lo, et al., 2017; Sarkar et al., 2013; Steven et al., 2014). Younger people have more time and more curiosity for exploring alternative tourism. Highly educated and high-income visitors have a better knowledge base and economic conditions for exploring thematic tourism because they possess more knowledge (Kerstetter, Hou, & Lin, 2004; Sarkar et al., 2013).

7.2.2 Differences between visitors in Hong Kong, Taiwan and mainland China

A one-way analysis of variance (ANOVA) test was performed to test the inter-site differences in the mean scores between three study areas. This test detected no inner differences in place attachment among the three study areas ($p > 0.05$). Significant inter-site differences were tested to investigate geologically responsible behaviour, environmentally responsible attitude, and visitor satisfaction ($p < 0.05$). The results indicate that visitors to different geoparks in the Greater China Region demonstrate similar levels of attachment to the geoparks they visited. Through the post hoc multiple comparisons test, the pattern of differences was the same in environmentally responsible attitudes and visitor satisfaction that visitors at the Yehliu Geopark scored the highest, Danxiashan Geopark scored in the middle and Hong Kong Geopark scored the lowest. As for geologically responsible behaviour, visitors in Danxiashan and Yehliu Geopark scored higher than in Hong Kong Geopark, but there is no significant different between Danxiashan Geopark and Yehliu Geopark.

Choosing the geoparks in Hong Kong, Taiwan and mainland China is to ensure the visitors shared similar cultural backgrounds, but geoparks applied the different management system. The setting, location, and management efforts of a geopark may possibly affect the environmental attitudes, responsible behaviours and satisfaction of their visitors. Better geopark management can facilitate better communication with visitors and hence enhance visitors' opportunities to gain positive attitudes towards geological conservation. In addition, the efforts that must be taken to reach the geopark can also help to screen out ordinary visitors. Less environmentally aware visitors and those who are not truly interested in understanding and appreciating geological features can thus be prevented from visiting these remote geoparks, which require long travel times.

7.2.3 Visitors’ willingness-to-pay to support geopark conservation

Chinese Geopark visitors' willingness-to-pay

In chapter 5 of this study, it is concluded that willingness-to-pay (WTP) may be affected by the level of economic development, environmental education, and environmentally related legislation. However, it is even more likely to be influenced by the strong visual impact of the vulnerability level of geological features. Danxiashan Geopark and Hong Kong Geopark are relatively magnificent. Faced with this enormous rocky geology, human beings feel small and powerless. However, in front of the Queen’s Head at Yehliu Geopark, the precarious head of the queen is more likely to arouse people’s protective desires. This study uses an open question format (OE) to ask the respondents to state their preferences regarding their maximum acceptable WTP amount. The average amount the 592 respondents are willing to pay is US $21.27, and the median is US $6.41. The ANOVA test results showed significant differences in WTP between Chinese visitors to geoparks in Hong Kong, Taiwan and mainland China. The median WTP values of the Hong Kong, Yeliu and Danxiashan Geopark visitors are $6.41, $3.29 and $14.49, respectively. Since One-way ANOVA detected significant inter-site differences, Post Hoc test was used to find the order of the

WTP value in three geoparks. Recording to the analysis result, the WTP of visitors in Danxiashan Geopark is higher than Hong Kong and Yehliu Geopark. But there is no significance in WTP of Chinese visitors in Hong Kong and Yehliu Geopark.

This previous studies holds that the WTP amount may possibly be affected by the degree of regional economic development. But the results of the study show that the data obtained from the developing area (Mainland China) is higher than that of Hong Kong and Taiwan which are developed areas. Therefore, this study deduce that this is related to the characteristics of the geopark itself like the length of stay and current price of adimission ticket to the geopark. The geopark size is not equal to the scope of visitor activities' range, the length of stay that determines the real range of activities. Duration of stay was asked in questionnaire, the mean length of the say in HK geopark is 0.89 day, in Yehliu Geopark is 0.88 day, in Danxiashan Geopark is 1.83 days. Therefore, Hong Kong Geopark and Yehliu Geopark comparable. But such a small Geopark cannot be found in mainland China.

Association between WTP and socio-economic variables

The results suggest that only the gender and occupation of Chinese geopark visitors indicated significant differences in WTP within groups. There is no significant inter difference in age, education and salary, which contradicts many other previous studies.

However, most previous studies were from Western countries. Limited studies on geopark visitors have been conducted in a Chinese context. Cross-cultural differences may be the cause of these discrepancies from the Western studies. Specifically, unlike many liberal Western countries, Chinese indigenous Confucianism may have influenced Chinese views on environmental ethics and money. For instance, higher education is not related to higher moral requirements in the public sphere. Chinese people pay more attention to private morality than to public morality (Chen, 2014; Cui, 2019; Fei, 1947). It is unscientific and one-sided to simply attribute environmental attitudes and behaviours to citizenship qualities, more profound cultural differences and underlying logic may be the root cause.

Association between GRB, PA, ERA, VS and WTP

The Spearman correlation test results suggested that place attachment (PA), environmentally responsible attitude (ERA), geopark visitor satisfaction (VS) and geologically responsible behaviour (GRB) were positively correlated with WTP to support geopark conservation and management. Stronger correlations were noted between VS, GRB and WTP than between PA and ERA. These findings are generally supported by previous studies, which suggested that people with more environmentally responsible attitude and behaviours support more environmentally responsible actions, including financial support for conservation.

7.2.4 Structural Equation Modelling

The SEM results in Chapter 7 of this thesis `confirm the validity and fitness of the proposed theoretical model. The SEM findings show that place attachment (PA) and geopark visitor satisfaction are not correlated with geologically responsible behaviour (GRB) but are directly correlated with environmental responsibility attitude (ERA), while ERA was directly and strongly correlated with GRB (squared multiple correlations=0.441), allowing ERA to act as a mediator linking PA and visitor satisfaction with GRB. In addition, PA was correlated with visitor satisfaction.

This study further confirmed that place attachment, visitor satisfaction, and environmentally responsible attitude play influential roles in geologically responsible behaviour. These findings could be useful for geopark managers seeking to improve visitor services in geoparks. Visitor activities such as a high-quality guided tours may be important in offering an experiential learning opportunity for visitors. Visitors could gain geological knowledge and be persuaded to become more environmentally friendly geopark visitors.

7.3 Research contribution

7.3.1 Theoretical implication

The theoretical contribution of this study to the literature on environmentally responsible behaviour is: 1) to the understanding the profile of Chinese geopark visitors in the Greater China Region, including Hong Kong, Taiwan and mainland China; 2) to the similarities and differences between Chinese geopark visitors from the different geoparks; 3) to provides empirical evidence for applying Attitude-Behaviour-Context (ABC) theory to explore the influencing factors and driving mechanism of visitors' environmentally responsible behaviour, deepening the theoretical basis of this field of research and holding a certain significance for promoting theoretical research on visitors' environmentally responsible behaviour.; 4) This paper incorporates place attachment into research on visitors' environmentally responsible behaviour, testing the influence of the level of human-land interaction on visitors' willingness to implement environmentally responsible behaviours and compensating for the limitations of previous related studies; 5) this study adopts structural equation model (SEM) to model the relationships among place attachment, visitor satisfaction, environmentally responsible attitude and geologically responsible behaviour; 6) this study provides empirical evidence for previous attitude-behaviour theories, that environmentally responsible attitude indeed influence behaviour.

7.3.2 Policy implication

In practice, this study focuses on the practical problem of how to cultivate and stimulate visitors' spontaneous geologically responsible behaviour, as well as its driving factors. This has certain practical significance for promoting the concept and practice of sustainable development in the geo-tourism industry. It provides new development ideas for the sustainable development of geo-tourism, which is help visitors to establish emotional connection with the Geopark to stimulate geologically responsible behaviour.

Specifically, this study can help authorities formulate appropriate management policies and strategies, like help visitor built the emotional connection and satisfaction with the destination to stimulate the geologically responsible behavior. The profile of geopark visitors in the Greater China Region can serve as a reference for tourism companies for the development and marketing of geo-tourism products, according their socio-economic information and preferences.

Understanding the characteristics of Chinese geopark visitors is vital to improving visitor management and will help minimize negative environmental impacts on invaluable geological resources by formulating regulations and better planning visitor facilities, maximize the economic benefits contributed by Chinese geopark visitors by developing suitable tourism products and routes, and promote earth science and the environmental awareness of the world's largest population. At last, the valuation of the willingness-to-pay of Chinese geopark visitors may inspire local communities to engage in sustainable geo-tourism.

7.4 Limitations and improvement measures

7.4.1 Sampling

Although we acquired 894 valid questionnaires in this study, only 592 of the questionnaires were used to analyse willingness-to-pay. Thus, there were only 151 valid questionnaires that included WTP in Danxiashan Geopark, and approximately 200 in each of Hong Kong Geopark and Taiwan Geopark. Consequently, when performing within-group comparisons of willingness-to-pay, the number of samples may be insufficient.

Both Hong Kong and Taiwan are relatively developed societies, but mainland China is a region with very uneven social development. The characteristics of geopark visitors in Danxiashan Geopark cannot be generalized to the characteristics of geopark visitors in mainland China. Within a given geopark, a large sample size plus acquiring information about the visitors' places of residence is the way to eliminate interference from regional economic factors.

7.4.2 Distinguish visitors

In contrast to ecotourism and wildlife-watching tourism, geoparks are also popular mass tourist destinations. Although this research randomly selected the respondents, independent tourists were easily selected because they had more time available and were easier to access. Mass tourists in groups primarily joined guided tours, whose high degree of organization and time constraints made it difficult for the tour members to find the 15 minutes needed to complete the questionnaire survey. Independent travel itself has certain restrictions regarding educational level and economic condition (Tsaur, Yen et al. 2010, Xiang 2013) that may affect the research results.

Therefore, better selection of geopark visitors and ordinary tourists should be considered in future research. At a minimum, the questionnaire should include a question regarding the form of tourism, such as "individual tourists" or "group tourists". Another approach is to involve relevant geological knowledge of the designated geoparks to identify the real geopark visitors.

7.4.3 Influences of geological features and landscapes

This study found that emphasizing the vulnerability of geological features may lead to greater environmental protection awareness. Thus, choosing the same geological types of geoparks would eliminate interference from geological features and landscape as much as possible. There is no doubt that a geopark may not have only a single geological feature. Thus, future research should identify several specific geopark categories based on the best geological characteristics of each site, such as the Danxia landform, volcanic landform, karst landform and animal fossils (dinosaurs or mammals).

References

Abrahamse, W., & Steg, L. (2009). How do socio-demographic and psychological factors relate to households' direct and indirect energy use and savings? *Journal of economic psychology, 30*(5), 711-720.

Aguilar, F. X., & Vlosky, R. P. (2007). Consumer willingness to pay price premiums for environmentally certified wood products in the U.S. *Forest Policy and Economics, 9*(8), 1100-1112. doi:http://dx.doi.org/10.1016/j.forpol.2006.12.001

Ainsworth, M. (1967). Patterns of attachment behavior. *MDS Ainsworth*.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211.

Ajzen, I. (2005). *Attitudes, personality, and behavior*: McGraw-Hill Education (UK).

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological bulletin, 84*(5), 888.

Alawadi, K. (2016). Place attachment as a motivation for community preservation: The demise of an old, bustling, Dubai community. *Urban Studies*, 0042098016664690.

Alegre, J., & Garau, J. (2010). Tourist satisfaction and dissatisfaction. *Annals of tourism Research, 37*(1), 52-73.

Altman, I., & Low, S. M. (2012). *Place attachment* (Vol. 12): Springer Science & Business Media.

Arin, T., & Kramer, R. A. (2002). Divers' willingness to pay to visit marine sanctuaries: an exploratory study. *Ocean & Coastal management, 45*, 171-183.

Ballantyne, R., Packer, J., & Everett, M. (2005). Measuring environmental education program impacts and learning in the field: using an action research cycle to develop a tool for use with young students. *Australian Journal of Environmental Education, 21*, 23-37.

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of environmental psychology, 27*(1), 14-25.

Baral, N., Stern, M. J., & Bhattarai, R. (2008). Contingent valuation of ecotourism in Annapurna conservation area, Nepal: Implications for sustainable park finance and local development. *Ecological Economics, 66*(2-3), 218-227.

Barnes, J. I., Schier, C., & Rooy, G. V. (1997). *Tourists' willingness to pay for wildlife viewing and wildlife conservation in Namibia*. Retrieved from Windhoek, Namibia:

Bowlby, J. (1969). Attachment and loss v. 3 (Vol. 1). *Random House. Furman, W., & Buhrmester, D.(2009). Methods and measures: The network of relationships inventory: Behavioral systems version. International Journal of Behavioral Development, 33*, 470-478.

Bowlby, J. (1982). Attachment and loss: retrospect and prospect. *American journal of Orthopsychiatry, 52*(4), 664.

Brehm, J. M., Eisenhauer, B. W., & Krannich, R. S. (2006). Community attachments as predictors of local environmental concern: The case for multiple dimensions of attachment. *American behavioral scientist, 50*(2), 142-165.

Buckley, R. (2004). *Environmental Impacts of Ecotourism*. Wallingford, Oxon: CABI Publishing.

Buckley, R., Zhong, L., & Ma, X. (2017). Visitors to protected areas in China. *Biological Conservation, 209*, 83-88.

Budeanu, A. (2007). Sustainable tourist behaviour–a discussion of opportunities for change. *International Journal of Consumer Studies, 31*(5), 499-508.

Camp, E., & Fraser, D. (2012). Influence of conservation education dive briefings as a management tool on the timing and nature of recreational SCUBA diving impacts on coral reefs. *Ocean & Coastal Management, 61*, 30-37. doi:http://dx.doi.org/10.1016/j.ocecoaman.2012.02.002

Caruana, R., Glozer, S., Crane, A., & McCabe, S. (2014). Tourists' accounts of responsible tourism. *Annals of tourism Research, 46*, 115-129.

Chen, A., Lu, Y., & Ng, Y. C. (2015). *The principles of geotourism*: Springer.

Chen, J. (2014). Talk again of Public Morality and Private Morality (in Chinese). *People's Education*(4), 76-77.

Chen, W. Y., & Jim, C. Y. (2012). Contingent valuation of ecotourism development in country parks in the urban shadow. *International Journal of Sustainable Development & World Ecology, 19*(1), 44-53.

Cheng, I. N. Y., Cheung, L. T. O., Chow, A. S. Y., Fok, L., & Cheang, C. C. (2018). The roles interpretative programmes in supporting the sustainable operation of the nature-based activities. *Journal of Cleaner Production, 200*, 380-389. doi:https://doi.org/10.1016/j.jclepro.2018.07.293

Cheng, T.-M., C. Wu, H., & Huang, L.-M. (2013). The influence of place attachment on the relationship between destination attractiveness and environmentally responsible behavior for island tourism in Penghu, Taiwan. *Journal of sustainable tourism, 21*(8), 1166-1187. doi:10.1080/09669582.2012.750329

Cheng, T.-M., & Wu, H. C. (2015). How do environmental knowledge, environmental sensitivity, and place attachment affect environmentally responsible behavior? An integrated approach for sustainable island tourism. *Journal of sustainable tourism, 23*(4), 557-576.

Cheung, L. T. (2013). *Improving visitor management approaches for the changing preferences and behaviours of country park visitors in H ong K ong.* Paper presented at the Natural resources forum.

Cheung, L. T. (2016). The effect of geopark visitors' travel motivations on their willingness to pay for accredited geo-guided tours. *Geoheritage, 8*(3), 201-209.

Cheung, L. T., Chow, A. S., Fok, L., Yu, K.-M., & Chou, K.-L. (2017). The effect of self-determined motivation on household energy consumption behaviour in a metropolitan area in southern China. *Energy Efficiency, 10*(3), 549-561.

Cheung, L. T., & Fok, L. (2014). The motivations and environmental attitudes of nature-based visitors to protected areas in Hong Kong. *International Journal of Sustainable Development & World Ecology, 21*(1), 28-38.

Cheung, L. T., Fok, L., & Fang, W. (2014). Understanding geopark visitors' preferences and willingness to pay for global geopark management and conservation. *Journal of Ecotourism, 13*(1), 35-51.

Cheung, L. T., & Jim, C. (2013). Ecotourism service preference and management in Hong Kong. *International Journal of Sustainable Development & World Ecology, 20*(2), 182-194.

Cheung, L. T., Lo, A. Y., & Fok, L. (2017). Recreational specialization and ecologically responsible behaviour of Chinese birdwatchers in Hong Kong. *Journal of sustainable tourism, 25*(6), 817-831.

Cheung, L. T., Ma, A. T., Lee, K. M., Lee, J. C., & Lo, Y. L. (2019). How does political orientation influence one's environmental attitude and behaviour? Debate over country park conservation in Hong Kong. *Environmental Science & Policy, 99*, 115-122.

Cheung, L. T. O. (2013). Improving visitor management approaches for the changing preferences and behaviours of country park visitors in Hong Kong. *Natural Resources Forum, 37*(4), 231-241. doi:10.1111/1477-8947.12025

Cheung, L. T. O., & Fok, L. (2013). Assessing the role of ecotourism training in changing participants' pro-environmental knowledge, attitudes and behaviours. *Asia Pacific Journal of Tourism Research*. doi:10.1080/10941665.2013.797003

Cheung, L. T. O., & Fok, L. (2014). The motivations and environmental attitudes of nature-based visitors to protected areas in Hong Kong. *International Journal of Sustainable Development & World Ecology*, *21*(1), 28-38. doi:10.1080/13504509.2013.832711

Cheung, L. T. O., & Hui, D. L. H. (2018). Influence of residents' place attachment on heritage forest conservation awareness in a peri-urban area of Guangzhou, China. *Urban Forestry & Urban Greening, 33*, 37-45. doi:https://doi.org/10.1016/j.ufug.2018.05.004

Cheung, L. T. O., & Jim, C. Y. (2006). Improving ecotourism practice to enhance protected area management in Hong Kong. In C. Y. Jim & R. T. Corlett (Eds.), *Sustainable Management of Protected Areas for Future Generations*. Hong Kong: IUCN, WCPA, Gland, Switzerland and Cosmos Books.

Cheung, L. T. O., & Jim, C. Y. (2013). Ecotourism service preference and management in Hong Kong. *International Journal of Sustainable Development & World Ecology*, *20*(2), 182-194. doi:10.1080/13504509.2013.775192

Cheung, T. O. (2010). *Understanding Ecotourist Perception of Ecotourism Services and Development in Hong Kong.* (PhD PhD Thesis). University of Hong Kong,

Chiu, Y.-T. H., Lee, W.-I., & Chen, T.-H. (2014). Environmentally responsible behavior in ecotourism: Antecedents and implications. *Tourism management, 40*, 321-329.

Chow, A. S. Y., Cheng, I. N. Y., & Cheung, L. T. O. (2019). Self-determined travel motivations and ecologically responsible attitudes of nature-based visitors to the Ramsar wetland in South China. *Annals of Leisure Research, 22*(1), 42-61. doi:10.1080/11745398.2017.1359791

Chow, A. S. Y., Liu, S., & Cheung, L. T. O. (2019). Importance of residents' satisfaction for supporting future tourism development in rural areas of Hong Kong. *Asian Geographer, 36*(2), 185-199. doi:10.1080/10225706.2019.1634110

Chow, A. S. Y., Ma, A. T. H., Wong, G. K. L., Lam, T. W. L., & Cheung, L. T. O. (2019). The Impacts of Place Attachment on Environmentally Responsible Behavioral Intention and Satisfaction of Chinese Nature-Based Tourists. *Sustainability, 11*(20), 5585. Retrieved from https://www.mdpi.com/2071-1050/11/20/5585

Ciuti, S., Northrup, J. M., Muhly, T. B., Simi, S., Musiani, M., Pitt, J. A., & Boyce, M. S. (2012). Effects of Humans on Behaviour of Wildlife Exceed Those of Natural Predators in a Landscape of Fear. *PLoS ONE, 7*(11), e50611. doi:10.1371/journal.pone.0050611

Cole, D. N. (2004). Impacts of hiking and camping on soils and vegetation: a review. In R. Buckley (Ed.), *Environmental Impacts of Ecotourism*. Wallingford, Oxon: CABI Publishing.

Cole, D. N., & Spildie, D. R. (1998). Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management, 53*(1), 61-67.

Cooper, C., Larson, L., Dayer, A., Stedman, R., & Decker, D. (2015). Are wildlife recreationists conservationists? Linking hunting, birdwatching, and pro-environmental behavior. *The Journal of Wildlife Management*, *79*(3), 446-457. doi:10.1002/jwmg.855

Cottrell, S. P. (2003). Influence of sociodemographics and environmental attitudes on general responsible environmental behavior among recreational boaters. *Environment and behavior, 35*(3), 347-375.

Cui, D. (2019). Private Morality and Public Morality in Confucianism (in Chinese）. *literature, history and philosophy*(1), 30-36.

Daniels, S. (1992). Place and the Geographical Imagination. *Geography*, *77*(4), 310-322. Retrieved from http://www.jstor.org/stable/40572252 de Groot, J. I. M., & Steg, L. (2010). Relationships between value orientations, self-determined motivational types and pro-environmental behavioural intentions. *Journal of environmental psychology, 30*(4), 368-378. doi:http://dx.doi.org/10.1016/j.jenvp.2010.04.002

Deng, J., Qiang, S., Walker, G. J., & Zhang, Y. (2003). Assessment on and Perception of Visitors'Environmental Impacts of Nature Tourism: A Case Study of Zhangjiajie National Forest Park, China. *Journal of sustainable tourism, 11*(6), 529-548. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=12416140&site=ehost-live

Dowling, R. K. (2013). Global geotourism–an emerging form of sustainable tourism. *Czech Journal of Tourism, 2*(2), 59-79.

Dowling, R. K., & Newsome, D. (2006). *Geotourism*: routledge.

Dowling, R. K., & Newsome, D. (2010). *Global geotourism perspectives*: Goodfellow Publishers Limited.

Du, Y., & Girault, Y. (2018). A genealogy of UNESCO global geopark: Emergence and evolution.

Dunlap, R. E., & Jones, R. E. (2002). Environmental concern: conceptual and measurement issues. In R. E. Dunlap & W. Michelson (Eds.), *Handbook of environmental sociology* (pp. 482–524). Westport, CT: Greenwood Press.

Dunlap, R. E., Van Liere, K. D., Mertig, A., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues, 56*, 425-442.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues, 56*(3), 425-442.

Eagles, P. F., & Cascagnette, J. W. (1995). Canadian Ecotourists: Who are they? *Tourism Recreation Research, 20*(1), 22-28.

Eusébio, C., Vieira, A. L., & Lima, S. (2018). Place attachment, host–tourist interactions, and residents' attitudes towards tourism development: The case of Boa Vista Island in Cape Verde. *Journal of sustainable tourism, 26*(6), 890-909.

Fairweather, J. R., Maslin, C., & Simmons, D. G. (2005). Environmental values and response to ecolabels among international visitors to New Zealand. *Journal of sustainable tourism, 13*(1), 82-98.

Farsani, N. T., Coelho, C., & Costa, C. (2010). Geoparks as art museums for geotourists. *Journal of Tourism and Development, 2*(13/14), 567-576.

Farsani, N. T., Coelho, C., & Costa, C. (2011). *Geoparks and geotourism: new approaches to sustainability for the 21st century*: Universal-Publishers.

Fei, X. (1947). *From the Soil*. Beijing: Joint Publishing.

Fishbein, M., & Ajzen, I. (2011). *Predicting and changing behavior: The reasoned action approach*: Taylor & Francis.

Fisher, C., Bashyal, S., & Bachman, B. (2012). Demographic impacts on environmentally friendly purchase behaviors. *J Target Meas Anal Mark, 20*(3-4), 172-184. Retrieved from http://dx.doi.org/10.1057/jt.2012.13

Fried, M. (1963). Grieving for a lost home [w:] LJ Duhl (red.), Handbook of theories of social Psychology, 151–171. In: New York: Basic Books.

Fu, W. (2019). The annual number of visitors to the National Geopark exceeds 500 million. *People's Daily*, p. A01. Retrieved from http://paper.people.com.cn/rmrb/html/2019-10/12/nw.D110000renmrb_20191012_7-01.htm

Garrod, B., Fyall, A., & Leask, A. (2006). Managing visitor impacts at visitor attractions: an international assessment. *Current Issues in Tourism, 9*(2), 125-151.

George, B. P., & George, B. P. (2004). Past visits and the intention to revisit a destination: Place attachment as the mediator and novelty seeking as the moderator. *Journal of Tourism Studies, 15*(2), 51.

GGN. (2010). Guidelines and Criteria for National Geoparks seeking UNESCO's assistance to join the Global Geoparks Network (GGN). Retrieved from http://www.globalgeopark.org/UploadFiles/2012_9_6/GGN2010.pdf

GGN. (2020). Global Geopark Network: Members list. Retrieved from http://www.globalgeopark.org/aboutGGN/list/index.htm

Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology, 49*(3), 141-157.

Giglio, V., Luiz, O., & Schiavetti, A. (2015). Recreational Diver Behavior and Contacts with Benthic Organisms in the Abrolhos National Marine Park, Brazil. *Environmental Management*, 1-12. doi:10.1007/s00267-015-0628-4

Giuliani, M. V., & Feldman, R. (1993). Place attachment in a developmental and cultural context| 314+ xx pp. $55.00 Irwin Altman, Setha M. Low, Place Attachment. Human Behavior and Environment. Advances in Theory and Research, Vol. 12, Plenum Press, Delhi (1992), ISBN: 0 306 44071 7. In: Academic Press.

Greider, T., & Garkovich, L. (1994). Landscapes: The social construction of nature and the environment. *Rural sociology, 59*(1), 1-24.

Gu, D., Gao, S., Wang, R., Jiang, J., & Xu, Y. (2018). The negative associations between materialism and pro-environmental attitudes and behaviors: individual and regional evidence from China. *Environment and behavior*, 0013916518811902.

Guagnano, G. A., Stern, P. C., & Dietz, T. (1995). Influences on attitude-behavior relationships: A natural experiment with curbside recycling. *Environment and behavior, 27*(5), 699-718.

Hall, C. M., & McArthur, S. (1997). *Integrated heritage management*: John Wiley & Sons.

Halpenny, E. A. (2006). *Environmental behaviour, place attachment and park visitation: A case study of visitors to Point Pelee National Park.* (Doctoral Thesis). University of Waterloo, Waterloo, Canada.

Halpenny, E. A. (2010). Pro-environmental behaviours and park visitors: The effect of place attachment. *Journal of environmental psychology, 30*(4), 409-421.

Hammitt, W., Cole, D., & Monz, C. (1998). Wildland recreation and resource impacts. *Wildland recreation: Ecology and management*, 3-20.

Hammitt, W. E., Kyle, G. T., & Oh, C.-O. (2009). Comparison of Place Bonding Models in Recreation Resource Management. *Journal of Leisure Research, 41*(1), 57-72. Retrieved from https://search.proquest.com/docview/201207309?accountid=11441

Hernandez, B., Hidalgo, M. C., & Ruiz, C. (2013). Theoretical and methodological aspects of research on place attachment. *Place attachment: Advances in theory, methods and applications*, 125-137.

Hidalgo, M. C., & Hernandez, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of environmental psychology, 21*(3), 273-281.

Hines, J. M., Hungerford, H. R., & Tomera, A. N. (1987). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *The Journal of Environmental Education, 18*(2), 1-8.

Hosany, S., Prayag, G., Van Der Veen, R., Huang, S., & Deesilatham, S. (2017). Mediating effects of place attachment and satisfaction on the relationship between tourists' emotions and intention to recommend. *Journal of Travel Research, 56*(8), 1079-1093.

Hose, T. A. (2000). European geotourism–geological interpretation and geoconservation promotion for tourists. *Geological heritage: its conservation and management. Instituto Tecnologico Geominero de Espana, Madrid*, 127-146.

Hose, T. A. (2008). Towards a history of geotourism: definitions, antecedents and the future. *Geological Society, London, Special Publications, 300*(1), 37-60.

Hose, T. A. (2011). The English origins of geotourism (as a vehicle for geoconservation) and their relevance to current studies. *Acta Geographica Slovenica, 51*(2), 343-359.

Imran, S., Alam, K., & Beaumont, N. (2014). Environmental orientations and environmental behaviour: Perceptions of protected area tourism stakeholders. *Tourism management, 40*, 290-299.

Jackson, L., Pang, M. F., Brown, E., Cain, S., Dingle, C., & Bonebrake, T. (2016). Environmental attitudes and behaviors among secondary students in Hong Kong. *International Journal of Comparative Education and Development*.

Jansson, J., Nordlund, A., & Westin, K. (2017). Examining drivers of sustainable consumption: The influence of norms and opinion leadership on electric vehicle adoption in Sweden. *Journal of Cleaner Production, 154*, 176-187.

Jim, C. Y. (1987). Camping impacts on vegetation and soil in a Hong Kong country park. *Applied Geography, 7*, 317-332

Jim, C. Y., & Shan, X. (2013). Socioeconomic effect on perception of urban green spaces in Guangzhou, China. *Cities, 31*(Supplement C), 123-131. doi:https://doi.org/10.1016/j.cities.2012.06.017

Joyce, E. B. (2010). Australia's geoheritage: history of study, a new inventory of geosites and applications to geotourism and geoparks. *Geoheritage, 2*(1-2), 39-56.

Juvan, E., & Dolnicar, S. (2014). The attitude–behaviour gap in sustainable tourism. *Annals of tourism Research, 48*, 76-95.

Kafyri, A., Hovardas, T., & Poirazidis, K. (2012). Determinants of visitor pro-environmental intentions on two small Greek islands: is ecotourism possible at coastal protected areas? *Environmental Management, 50*(1), 64-76.

Kaiser, F. G. (1996). Environmental attitude and ecological behavior.

Kaiser, F. G., Wolfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of environmental psychology, 19*(1), 1-9.

Kaiser, F. G., Wölfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of environmental psychology, 19*(1), 1-19.

Kang, K. H., Stein, L., Heo, C. Y., & Lee, S. (2012). Consumers' willingness to pay for green initiatives of the hotel industry. *International Journal of Hospitality Management, 31*(2), 564-572. doi:http://dx.doi.org/10.1016/j.ijhm.2011.08.001

Kentucky Environmental Education Council. (2009). *The 2009 survey of Kentuckians' environmental knowledge, attitudes and behvaiors*. Retrieved from Frankfort, KY.:

Kerstetter, D. L., Hou, J.-S., & Lin, C.-H. (2004). Profiling Taiwanese ecotourists using a behavioral approach. *Tourism management, 25*(4), 491-498.

Khaled, A. (2017). Place attachment as a motivation for community preservation: The demise of an old, bustling, Dubai community. *Urban Studies, 54*(13), 2973-2997. doi:10.1177/0042098016664690

Kil, N., Holland, S. M., Stein, T. V., & Ko, Y. J. (2012). Place attachment as a mediator of the relationship between nature-based recreation benefits and future visit intentions. *Journal of sustainable tourism, 20*(4), 603-626.

Kilbourne, W., & Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *Journal of Business Research, 61*(9), 885-893.

Kim, S. S., Kim, M., Park, J., & Guo, Y. (2008). Cave Tourism: Tourists' Characteristics, Motivations to Visit, and the Segmentation of Their Behavior. *Asia Pacific Journal of Tourism Research, 13*(3), 299-318. doi:10.1080/10941660802280448

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research, 8*(3), 239-260.

Kondo, M. C., South, E. C., & Branas, C. C. (2015). Nature-based strategies for improving urban health and safety. *Journal of Urban Health, 92*(5), 800-814.

Kronenberg, J. (2014). Environmental Impacts of the Use of Ecosystem Services: Case Study of Birdwatching. *Environmental Management, 54*(3), 617-630. doi:10.1007/s00267-014-0317-8

Kyle, G. T., Absher, J. D., & Graefe, A. R. (2003). The Moderating Role of Place Attachment on the Relationship Between Attitudes Toward Fees and Spending Preferences. *Leisure Sciences, 25*(1), 33-50. doi:10.1080/01490400306552

Larson, S., De Freitas, D. M., & Hicks, C. C. (2013). Sense of place as a determinant of people's attitudes towards the environment: Implications for natural resources management and planning in the Great Barrier Reef, Australia. *Journal of Environmental Management, 117*(Supplement C), 226-234. doi:https://doi.org/10.1016/j.jenvman.2012.11.035

Lee, K. M., Lee, J. C., Ma, A. T., & Cheung, L. T. (2019). Does human rights awareness spur environmental activism? Hong Kong's 'country park'controversy. *Land Use Policy, 87*, 104033.

Lee, S., McMahan, K., & Scott, D. (2015). The Gendered Nature of Serious Birdwatching. *Human Dimensions of Wildlife, 20*(1), 47-64. doi:10.1080/10871209.2015.956375

Lee, T. H. (2011). How recreation involvement, place attachment and conservation commitment affect environmentally responsible behavior. *Journal of sustainable tourism, 19*(7), 895-915. doi:10.1080/09669582.2011.570345

Lee, T. H., & Jan, F.-H. (2015). The effects of recreation experience, environmental attitude, and biospheric value on the environmentally responsible behavior of nature-based tourists. *Environmental Management, 56*(1), 193-208.

Lee, T. H., Jan, F.-H., & Yang, C.-C. (2013). Conceptualizing and measuring environmentally responsible behaviors from the perspective of community-based tourists. *Tourism management, 36*, 454-468.

Lee, W. H., & Moscardo, G. (2005). Understanding the Impact of Ecotourism Resort Experiences on Tourists' Environmental Attitudes and Behavioural Intentions. *Journal of sustainable tourism, 13*(6), 546-565. doi:10.1080/09669580508668581

Leskošek, V. (2011). Historical perspective on the ideologies of motherhood and its impact on social work. *Social Work & Society, 9*(2).

Lin, J.-C., & Su, S.-J. (2019). Taiwan's Geoparks. In *Geoparks of Taiwan* (pp. 1-53): Springer.

Lo, A. Y., & Jim, C. Y. (2015). Community attachment and resident attitude toward old masonry walls and associated trees in urban Hong Kong. *Cities, 42*(Part A), 130-141. doi:https://doi.org/10.1016/j.cities.2014.09.006

López-Mosquera, N., & Sánchez, M. (2014). Cognitive and affective determinants of satisfaction, willingness to pay, and loyalty in suburban parks. *Urban forestry & urban greening, 13*(2), 375-384.

Lorenzo, A. B., Blanche, C. A., Qi, Y., & Guidry, M. M. (2000). Assessing residents' willingness to pay to preserve the community urban forest: A small-city case study. *Journal of Arboriculture, 26*(6), 319-325.

Luo, Y., & Deng, J. (2008). The New Environmental Paradigm and nature-based tourism motivation. *Journal of Travel research, 46*(4), 392-402.

M.N.R. (2010). *Technical requirements for national geopark planning (in Chinese)*. Retrieved from

Ma, A. T. H., Chow, A. S. Y., Cheung, L. T. O., & Liu, S. (2018). Self-determined travel motivation and environmentally responsible behaviour of Chinese visitors to national forest protected areas in South China. *Global Ecology and Conservation, 16*, e00480. doi:https://doi.org/10.1016/j.gecco.2018.e00480

Maller, C., Townsend, M., Pryor, A., Brown, P., & St Leger, L. (2006). Healthy nature healthy people:'contact with nature'as an upstream health promotion intervention for populations. *Health promotion international, 21*(1), 45-54.

Maple, L. C., Eagles, P. F. J., & Rolfe, H. (2010). Birdwatchers' specialisation characteristics and national park tourism planning. *Journal of Ecotourism, 9*(3), 219-238. doi:10.1080/14724040903370213

Marion, J. L., & Reid, S. E. (2007). Minimising Visitor Impacts to Protected Areas: The Efficacy of Low Impact Education Programmes. *Journal of sustainable tourism, 15*(1), 5-27. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=23871151&site=ehost-live

Marvin, R., & Britner, P. (1999). Normative development: The ontogeny of attachment. U: J. Cassidy i PR Shaver (ur.), Handbook of attachment: Theory, research, and clinical applications (44-67), New York. In: Guilford Press.

Marzano, M., & Dandy, N. (2012). Recreationist behaviour in forests and the disturbance of wildlife. *Biodiversity and Conservation, 21*(11), 2967-2986. doi:10.1007/s10531-012-0350-y

Milligan, M. J. (1998). Interactional past and potential: The social construction of place attachment. *Symbolic interaction, 21*(1), 1-33.

Newsome, D., Dowling, R. K., & Moore, S. A. (2005). *Wildlife tourism* (Vol. 24): Channel View Publications.

Newsome, D., Moore, S. A., & Dowling, R. K. (2012). *Natural area tourism: Ecology, impacts and management* (Vol. 58): Channel view publications.

Ng, C. Y. (2007, 11-2-2007). The Diverse Geological Feature at East Sai Kung are proposed for World Geopark, Newpaper. *Mingpao*. Retrieved from http://hk.news.yahoo.com/070210/12/21lma.html

NGNC. (2020). National Geopark Nextwork of China. Retrieved from http://cn.globalgeopark.org/index.htm

Niesenbaum, R. A., & Gorka, B. (2001). Community-Based Eco-Education: Sound Ecology and Effective Education. *Journal of Environmental Education*, *33*(1), 12. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=6528578&site=ehost-live

Noblet, C. L., Anderson, M., & Teisl, M. F. (2013). An empirical test of anchoring the NEP scale in environmental ethics. *Environmental Education Research, 19*(4), 540-551.

Ólafsdóttir, R., & Tverijonaite, E. (2018). Geotourism: A systematic literature review. *Geosciences, 8*(7), 234.

Oliver, R. L. (2000). Customer satisfaction with service. *Handbook of services marketing and management*, 247-254.

P, M., & Zouros, N. (2005). Geoparks: Celebrating Earth heritage, sustaining local communities. *Episodes, 28*, 274-278. doi:10.18814/epiiugs/2005/v28i4/006

Packer, J., Ballantyne, R., & Hughes, K. (2014). Chinese and Australian tourists' attitudes to nature, animals and environmental issues: Implications for the design of nature-based tourism experiences. *Tourism management, 44*, 101-107. doi:http://dx.doi.org/10.1016/j.tourman.2014.02.013

Patzak, M., & Eder, W. (1998). " UNESCO GEOPARK". A new Programme-A new UNESCO label. *Geologica Balcanica, 28*, 33-36.

Petrolia, D. R., Interis, M. G., & Hwang, J. (2014). America’s wetland? A national survey of willingness to pay for restoration of Louisiana’s coastal wetlands. *Marine Resource Economics, 29*(1), 17-37.

Pizam, A., Neumann, Y., & Reichel, A. (1978). Dimentions of tourist satisfaction with a destination area. *Annals of tourism Research*, *5*(3), 314-322.

Prayag, G., & Ryan, C. (2012). Antecedents of Tourists’ Loyalty to Mauritius: The Role and Influence of Destination Image, Place Attachment, Personal Involvement, and Satisfaction. *Journal of Travel Research, 51*(3), 342-356. doi:10.1177/0047287511410321

Proshansky, H. M. (1978). The city and self-identity. *Environment and behavior, 10*(2), 147-169.

Ramkissoon, H., Graham Smith, L. D., & Weiler, B. (2013). Testing the dimensionality of place attachment and its relationships with place satisfaction and pro-environmental behaviours: A structural equation modelling approach. *Tourism management, 36*(Supplement C), 552-566. doi:https://doi.org/10.1016/j.tourman.2012.09.003

Ramkissoon, H., Smith, L. D. G., & Weiler, B. (2013). Relationships between place attachment, place satisfaction and pro-environmental behaviour in an Australian national park. *Journal of sustainable tourism, 21*(3), 434-457.

Ramkissoon, H., Weiler, B., & Smith, L. D. G. (2012). Place attachment and pro-environmental behaviour in national parks: The development of a conceptual framework. *Journal of sustainable tourism, 20*(2), 257-276.

Raymond, C. M., Kyttä, M., & Stedman, R. (2017). Sense of Place, Fast and Slow: The Potential Contributions of Affordance Theory to Sense of Place. *Frontiers in Psychology, 8*(1674). doi:10.3389/fpsyg.2017.01674

Rholes, W., & Simpson, J. A. (2004). *Adult attachment: Theory, research, and clinical implications*: Guilford Publications.

Robinson, A. M. (2008). *Geotourism: who is a geotourist.* Paper presented at the Inaugural National Conference Green Travel, Climate Change and Ecotourism, Adelaide.

Rowntree, L. (1981). Creating a sense of place: The evolution of historic preservation of Salzburg, Austria. *Journal of Urban History, 8*(1), 61-76.

Sarkar, S. K., Au, N., & Law, R. (2013). Analysing ecotourists' satisfaction in socialisation and knowledge sharing intentions via social media. In *Information and communication technologies in tourism 2014* (pp. 313-326): Springer.

Schwartz, S. H. (1977). Normative influences on altruism. *Advances in experimental social psychology, 10*(1), 221-279.

Sivek, D. J., & Hungerford, H. (1990). Predictors of responsible behavior in members of three Wisconsin conservation organizations. *The Journal of Environmental Education, 21*(2), 35-40.

Stern, P. C. (2000). New environmental theories: toward a coherent theory of environmentally significant behavior. *Journal of social issues, 56*(3), 407-424.

Steven, R., Morrison, C., & Castley, J. G. (2014). Birdwatching and avitourism: a global review of research into its participant markets, distribution and impacts, highlighting future research priorities to inform sustainable avitourism management. *Journal of sustainable tourism*, 1-20. doi:10.1080/09669582.2014.924955

Stoffelen, A., & Vanneste, D. (2015). An integrative geotourism approach: Bridging conflicts in tourism landscape research. *Tourism Geographies, 17*(4), 544-560.

Tao, C. H., Eagles, P. F., & Smith, S. L. J. (2004). Profiling Taiwanese ecotourists using a self-definition approach. *Journal of sustainable tourism*, *12*(2), 149-168.

Thapa, B., Graefe, A. R., & Meyer, L. A. (2005). Moderator and Mediator Effects of Scuba Diving Specialization on Marine-Based Environmental Knowledge-Behavior Contingency. *The Journal of Environmental Education, 37*(1), 53-67. doi:10.3200/joee.37.1.53-68

Togridou, A., Hovardas, T., & Pantis, J. D. (2006). Determinants of visitors' willingness to pay for the national marine park of Zakynthos, Greece. *Ecological Economics, 60*(1), 308-319.

Tonge, J., Ryan, M. M., Moore, S. A., & Beckley, L. E. (2015). The effect of place attachment on pro-environment behavioral intentions of visitors to coastal natural area tourist destinations. *Journal of Travel Research, 54*(6), 730-743.

Tuan, Y.-F. (1979). Space and place: humanistic perspective. In *Philosophy in geography* (pp. 387-427): Springer.

Tuan, Y.-F. (1990). *Topophilia: A study of environmental perceptions, attitudes, and values*: Columbia University Press.

U.N. (2007). The United Nations Development Agenda: Development for All. Retrieved from https://www.un.org/esa/devagenda/UNDA_BW5_Final.pdf

Ujang, N. (2012). Place attachment and continuity of urban place identity. *Procedia-Social and Behavioral Sciences, 49*, 156-167.

UNESCO. (2006). Global Network of National Geoparks. Retrieved from http://www.unesco.org/science/earth/geoparks.shtml

Valkila, N., & Saari, A. (2013). Attitude–behaviour gap in energy issues: Case study of three different Finnish residential areas. *Energy for Sustainable Development, 17*(1), 24-34. doi:http://dx.doi.org/10.1016/j.esd.2012.10.001

van den Bosch, M., & Sang, Å. O. (2017). Urban natural environments as nature-based solutions for improved public health–A systematic review of reviews. *Environmental research, 158*, 373-384.

Vaske, J. J., Decker, D. J., & Manfredo, M. J. (1995). Human dimensions of wildlife management: An integrated framework for coexistence. In R. L. Knoght & K. J. Gutzwiller (Eds.), *Wildlife and recreationists. Coexistence through management research*. Washington, DC.: Island Press.

Vaske, J. J., & Kobrin, K. C. (2001). Place Attachment and Environmentally Responsible Behavior. *The Journal of Environmental Education, 32*(4), 16-21. doi:10.1080/00958960109598658

Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, J. (2013). Environmental knowledge and other variables affecting pro-environmental behaviour: comparison of university students from emerging and advanced countries. *Journal of Cleaner Production, 61*, 130-138. doi:http://dx.doi.org/10.1016/j.jclepro.2013.05.015

Vujcic, M., Tomicevic-Dubljevic, J., Grbic, M., Lecic-Tosevski, D., Vukovic, O., & Toskovic, O. (2017). Nature based solution for improving mental health and well-being in urban areas. *Environmental research, 158*, 385-392.

Walker, A. J., & Ryan, R. L. (2008). Place attachment and landscape preservation in rural New England: A Maine case study. *Landscape and urban planning, 86*(2), 141-152.

Wang, L., Tian, M., & Wang, L. (2015). Geodiversity, geoconservation and geotourism in Hong Kong global geopark of China. *Proceedings of the Geologists' Association, 126*(3), 426-437.

Webb, D., Soutar, G. N., Mazzarol, T., & Saldaris, P. (2013). Self-determination theory and consumer behavioural change: Evidence from a household energy-saving behaviour study. *Journal of environmental psychology, 35*, 59-66.

Wight, P. A. (1996). North American ecotourist: market profile and trip characteristics. *Journal of Travel Research, 34*(4), 2-10.

Wight, P. A. (2001). Ecotourists: not a homogeneous market segment. In D. Weaver (Ed.), *The Encyclopedia of Ecotourism*. New York: CAB International.

Williams, D. R. (2014). Beyond the commodity metaphor'revisited: Some methodological reflections on place attachment research. *Place attachment: Advances in theory, methods, and research*, 89-99.

Yiling, W., & Junquan, L. (2010). A study on visitors' behaviors and norms at Yehliu Geopark. *Journal of Geographical Science (Taiwan)*, *60*, 45-65.

Zouros, N., & McKeever, P. (2009). *European geoparks network and geotourism.* Paper presented at the New challenges with geotourism. Proceedings of the VIII European Geoparks Conference, Idanha-a-Nova.

Appendix A: Questionnaire Survey for Hong Kong Geopark

（It is the same questionnaire used in Danxiashan Geopark and Yehliu Geopark except the particular geopark name and currency）

Introduction

Greetings from a student from the Education University of Hong Kong. I would like to ask for your participation in this PROJECT, for which I am looking for travel perceptions of geopark visitors to understand your place attachment, environmental attitudes and behaviours. This is a research study and all your answers will be strictly kept confidential. No information that can identify you will be collected.

Part I: Place attachment

For each statement below, please indicate whether you strongly disagree (SD), mildly disagree (MD), Neutral (N), mildly agree (MA) or strongly agree (SA) with it.

Statement		Strongly disagree (SD)	Mildly disagree (MD)	Neutral (N)	Mildly agree (MA)	Strongly agree (SA)
1	Geotourism is meaningful to me.					
2	I identify strongly with visiting here.					
3	I am very attached to visiting here.					
4	I have a special connection to visiting here and other tourists who visit here.					
5	I enjoy visiting here more than visiting any other place.					
6	I get more satisfaction visiting here than visiting any other place.					
7	Visiting here is more important to me than visiting any other place.					
8	I would not substitute any other type of recreation for what I do here.					
9	I choose to visit here because the admission fee is not expensive.					
10	I choose to visit here because the location of the place is convenient					
11	This destination is the best place for the activities I like to do.					
12	Visiting this destination makes me feel safe.					

13	I have a lot of memories in the place.					
14	I feel a general sense of well-being while visiting this destination.					
15	Visiting here reminds me of my experiences in the past.					
16	The place has unique characteristics, such as architecture, historical monuments or particular environment.					
17	When I am away I miss the place.					

Part II: Environmental Attitudes

Statement		Strongly disagree (SD)	Mildly disagree (MD)	Neutral (N)	Mildly agree (MA)	Strongly agree (SA)
1	The earth has plenty of natural resources if we just learn how to develop them					
2	For the sake of improved leisure opportunities, it is good to develop more recreation area					
3	When economic growth is in conflict with environmental conservation, environmental conservation should be given the priority					
4	Humans have the right to modify the natural environment to suit their needs					
5	Plants and animals have as much right as humans to exist					
6	Enjoying natural resources is basic right. It is inappropriate for the government to make laws to control people’s use of natural resources.					
7	Human beings have the right to satisfy their own needs by altering the natural environment					
8	When human beings engage in any leisure and recreational activities,					

	they should avoid disturbing local natural environment					
9	The balance of nature is very delicate and easily upset					

Part III Geological Responsible Behavior

Statement		Strongly disagree (SD)	Mildly disagree (MD)	Neutral (N)	Mildly agree (MA)	Strongly agree (SA)
1	I do not take away any rock, fossil or mineral.					
2	I do not dig up, damage or deface any rocks at this geopark.					
3	I do not climb the rock columns or trample.					
4	I try to keep quiet during the trip.					
5	I try to maintain the local environment quality.					
6	I take away all the clutter and garbage.					
7	I try to protect the fauna and flora during my trip.					
8	I accept the control policy not to enter the core area of the geopark.					
9	I report to the park administrator if encountering any environmental pollution or destructions.					
10	I prefer to join in the tours guided by professional and skilled guides if there is any.					
11	I will share my experience with my friends or family.					
12	I will encourage with my friends or family to join in geopark conservation.					
13	I will join in voluntary to help the public to learn more about geotourism and geopark.					
14	I will donate money to support HK geoparks.					

Part IV Satisfaction

Statement (I am satisfied with………)		Strongly disagree	Mildly disagree	Neutral	Mildly agree	Strongly agree
1	Unique geological features					
2	Attractive mountainous areas					
3	Diverse species of flora and fauna					
4	Whole scenery and landscape					
5	Convenient public transports					
6	Clear and useful maps of displaying locations					
7	Clear visiting signposts					
8	Maintenance of geo trail					
9	Interesting information board					
10	Easy access to toilets					
11	Sufficient security facilities (e.g. parapet, warning signs)					
12	Sufficient education information about rocks and biological species					
13	Sufficient recreational facilities (e.g. tables and benches, shelters)					
14	Sufficient conservation information about rocks and biological species					
15	Integrated conservation strategy					
16	Overall satisfaction					

Part V Travel Cost and Willingness-to-pay

1. How many times you have come to this site this year? ______ times
2. Which city do you live? ________________________
3. How much did you cost for transportation? ____________________HKD
4. How much did you cost for accommodation? ___________________HKD
5. How much did you cost on-site (including the expenses for entrance fee, food & beverage, souvenirs & gifts, information materials and other related costs)? _____________HKD
6. How long did you plan to stay in Hong Kong Geopark? _________________
7. Whether you have chosen this site as your priority? ☐ Yes ☐ No
8. Global geopark has been widely recognized as a representative geological characteristics and scientific value. Currently, the local administration is planning to raise extra funds to improve geopark management and promote relevant conservation, and an admission fee for geopark visits will be established or raised. Are you willing to pay?
   Yes ☐ No ☐
9. If yes, how much would you pay for a visit to this global geopark? __________HKD
10. If No, Why

☐ This environment should be publicly owned, I don't think we need to pay
☐ I don't think this destination worth to pay for visit
☐ Government should pay for us
☐ I don't want to pay because the admission ticket is unacceptably expensive
☐ Other: ______________________________

Part VI Socio-demographic information

Gender	☐ M ☐ F
Age	☐ 18-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 or above
Education background	☐ Primary or below ☐ Secondary School ☐ Post-secondary ☐ Undergraduate ☐ Postgraduate or above
Occupation	☐ Unemployed ☐ Employed ☐ Housewife ☐ Student ☐ Retired ☐ Other (Specify)______________________
Monthly income (HKD)	☐ No Salary ☐ Very Low Income ☐ Low Income ☐ Middle-low Income ☐ Middle Income ☐ Middle-high Income ☐ High Income ☐ Very High Income

Questionnaire completed. Thank you for your participation!

Appendix B: Questionnaire Survey for Hong Kong Geopark (in Traditional Chinese)

關於中國香港世界地質公園的調查問卷

您好，我是從事地質旅遊研究的香港教育大學博士生芶銳。我誠摯地邀請您參與此次關於中國香港世界地質公園的調查問卷，我希望由此找出地質公園遊客對地質旅遊的感知。本次問卷採用匿名的形式，您的答案將會被嚴格保密，內容不涉及隱私及敏感資訊。

第一部分 地方歸屬感

下列陳述有關您對香港地質公園的歸屬感，請在每個陳述後面的表格內選擇對此陳述是否完全不同意、比較不同意、不確定、比較同意或者完全同意。

陳述		完全不同意	比較不同意	不確定	比較同意	完全同意
1	地質旅遊對我來說很有意義。					
2	我強烈認同到這裡遊覽。					
3	我十分喜愛來這裡遊覽。					
4	我對這裡及來這裡遊覽的遊客有特別的好感。					
5	比起去其他地方，我更享受來這裡。					
6	比起去其他地方，我在這裡得到更多的滿足感。					
7	比起去其他地方，來這裡遊覽對我來說更重要。					
8	其他任何形式的娛樂都不能替代我在這裡遊覽。					
9	我選擇這裡遊覽因為這裡收費較低。					
10	我選擇這裡遊覽因為這裡交通方便。					
11	我可以在這個景區裡進行我喜歡的活動。					
12	遊覽這裡讓我有安全感。					
13	我在這個地方有很多回憶。					
14	我對這個景區有很強的歸屬感。					
15	遊覽這裡讓我想起過去的經歷。					
16	這個地方有自己的特色，例如特有的環境、獨特的建築或歷史。					
17	當我離開的時候，我會想念這裡。					

第二部分 環境態度

	陳述	完全 不同意	比較 不同意	不確定	比較 同意	完全 同意
1	如果我們善於開發的話，地球有大量的自然資源。					
2	為增加更多休憩機會，應該開發更多的休閒區域。					
3	當經濟發展與環境保護發生矛盾的時候，環境保護應該首先被考慮。					
4	人有權改造自然環境以適應人的需求。					
5	動植物擁有和人類一樣多的生存權利。					
6	享受自然資源是一項基本權利，政府並不應該制定法律來限制人們使用自然資源。					
7	人類有權通過更改自然環境以滿足自身的需求。					
8	人類參與任何休閒娛樂活動時，都應該避免干擾當地的自然環境。					
9	自然的平衡是非常脆弱的，而且很容易被擾亂。					
10	目前，香港地質公園的環境保育工作做得很好。					

第三部分 親環境行為

陳述		完全 不同意	比較 不同意	不確定	比較 同意	完全 同意
1	我不帶走任何岩石、化石或者礦物。					
2	我不挖掘、不破壞或不污損這個地質公園裡的任何岩石。					
3	我不攀爬石柱或踐踏岩石。					
4	我帶走所有的雜物和垃圾。					
5	我努力保持當地的環境品質。					
6	在行程中，我盡量保持安靜。					
7	在行程中，我努力保護動植物。					
8	我接受不許進入地質公園核心區域的控制政策。					
9	如果遇到環境污染或者破壞的情況，我會向公園管理人員報告。					
10	如果有的話，我更願意參加由專業和熟練的導遊引導的旅程。					
11	我會向我對朋友和家人分享我在這裡的經歷。					
12	我會鼓勵我的朋友和家人參加地質公園的保護。					

13	我會參加義工活動，幫助公眾更多地瞭解地質旅遊和地質公園的保護。					
14	我會捐錢支持香港地質公園。					

第四部分 滿意程度

陳述		非常不滿意	比較不滿意	不確定	比較滿意	完全滿意
1	獨特的地質地貌					
2	有吸引力的山地					
3	動植物品種多樣					
4	整個景區景觀					
5	方便的公共交通					
6	位置顯示清楚並實用的地圖					
7	清楚的遊覽指示牌					
8	地質步道的保養和維護					
9	有趣的信息板					
10	洗手間方便前往					
11	足夠的安全設施（如護欄、警示牌）					
12	關於岩石和生物物種有充足的教育資訊					
13	足夠的休閒娛樂設施（如涼亭、觀景台）					
14	關於岩石和生物物種有充足的保育資訊					
15	綜合的保育政策					
16	總體滿意度					

第五部分 旅行費用與支付意願

1. 您今年第幾次來香港地質公園遊覽? ______ 次
2. 您在哪個城市生活? ______________
3. 您在交通方面花費了多少錢？ __________
4. 您在住宿方面花費了多少錢？ __________
5. 您在地質公園內花費了多少錢 (包括門票、餐飲、旅遊紀念品、當地土特產、印刷品及其他)? ____
6. 您準備在香港地質公園停留幾天? _________________
7. 這裡是您首選的旅遊目的地嗎? □ 是 □ 否
8. 世界地質公園擁有豐富的地質地貌資源和科學價值。如果地質公園管理者計畫提高地質公園管理和相關宣傳保育經費，門票價格也因此會提高，您會願意支付嗎？
   □ 願意 □ 不願意
9. 如果願意，您願意為香港地質旅遊支付多少錢？__________

10. 如果不願意，請問為什麼：
- □ 這個環境本來就屬於公眾，所以我不需要支付
- □ 我覺得這個旅遊目的地不值得花錢去遊覽
- □ 政府應當為我們支付
- □ 我不願意支付因為門票已經貴到超出接受範圍
- □ 其他原因:

____

第六部分 個人資訊

性別	□ 男 □女
年齡	□ 18-25 □ 26-35 □ 36-45 □ 46-55 □ 56-65 □ 66 歲或以上
教育背景	□ 小學及以下 □中學 □大專 □大學本科 □研究生及以上
職業	□ 失業人士 □ 就業人士 □家庭主婦 □學生 □退休人士 □ 其他 (請列出：____________________)
月收入 (港幣)	□ 沒有收入 □ 極低收入 □ 低收入 □ 中等偏低收入 □ 中等收入 □ 中等偏高收入 □ 高收入 □ 很高收入

問卷完成，謝謝您的參與！

Appendix C: Questionnaire Survey for Danxiashan Geopark (in Simplified Chinese)

关于丹霞山世界地质公园的调查问卷

您好，我是从事地质旅游研究的香港教育大学博士研究生苟锐。我诚挚地邀请您参与此次关于丹霞山世界地质公园的调查问卷，我希望由此找出丹霞山地质公园游客对地质旅游的感知。本次问卷采用匿名的形式，所有研究调查以及您的答案将会被严格保密，内容不涉及隐私及敏感信息。

第一部分 地方归属感

下列陈述有关丹霞山地质公园的游客对地方依附的态度。请在每个陈述后面的表格内选择对此陈述是否完全同意、比较不同意、不确定、比较同意或者完全同意。

陈述		完全不同意	比较不同意	不确定	比较同意	完全同意
1	地质旅游对我来说很有意义。					
2	我强烈认同到这里游览。					
3	我十分喜爱来这里游览。					
4	我对这里及来这里游览的游客有特别的好感。					
5	比起去其他地方，我更享受来这里。					
6	比起去其他地方，我在这里得到更多的满足感。					
7	比起去其他地方，来这里游览对我来说更重要。					
8	其他任何形式的娱乐都不能替代我在这里游览					
9	我选择这里游览因为：收费较低。					
10	我选择这里游览因为这里交通方便。					
11	我可以在这个景区里进行我喜欢的活动。					
12	游览这里让我有安全感。					
13	我在这个地方有很多回忆。					
14	我对这个景区有很强的归属感。					
15	游览这里让我想起过去的经历。					

16	这个地方有自己的特色，例如特有的环境。					
17	当我离开的时候我会想念这里。					

第二部分 环境态度

陈述		完全不同意	比较不同意	不确定	比较同意	完全同意
1	如果我们善于开发的话，地球上有大量的自然资源。					
2	如果要增加更多休憩机会，应该开发更多休闲区域。					
3	当经济发展与环境保护发生矛盾的时候，环境保护应该首先被考虑。					
4	人类有权改造自然环境以适应人类的需求。					
5	动植物拥有和人类一样多的生存权利。					
6	享受自然资源是一项基本权利，政府并不应该制定法律来限制人们使用自然资源。					
7	人类有权更改自然资源以满足自身的需求。					
8	人类参与任何休闲娱乐活动时，都应该避免干扰当地的自然环境					
9	自然的平衡是非常脆弱的，而且很容易被扰乱。					

第三部分 亲环境行为

陈述		完全不同意	比较不同意	不确定	比较同意	完全同意
1	我不带走任何岩石、化石或者矿物。					
2	我不挖、不破坏或不污损这个地质公园里的任何岩石。					
3	我不攀爬石柱或践踏岩石。					
4	我带走所有的杂物和垃圾。					

5	我努力保持当地的环境质量。					
6	在行程中我尽量保持安静。					
7	在行程中努力保护动植物。					
8	我接受不许进入地质公园核心区域的控制政策。					
9	如果遇到环境污染或者破坏的情况，我会向公园管理人员报告。					
10	如果有的话，我更愿意参加由专业和熟练的导游引导的旅程。					
11	我会向我对朋友和家人分享我在这的经历。					
12	我会鼓励并推荐我的朋友和家人参加地质公园的保护。					
13	我会参加义工活动，帮助公众更多地了解地质旅游和地质公园的保护。					
14	我会捐钱支持丹霞山地质公园。					

第四部分 旅行费用与支付意愿

11. 您今年第几次来丹霞山游览? ______ 次
12. 您在哪个城市生活? ______________
13. 您在交通方面花费了多少钱？ __________
14. 您在住宿方面花费了多少钱？ __________
15. 您在丹霞山本地花费了多少钱 (包括门票、餐饮、旅游纪念品、当地土特产、印刷品及其他)？____
16. 您准备在丹霞山停留几天? _________________
17. 这里是您首选的旅游目的地吗? □ 是 □ 否
18. 世界地质公园拥有丰富的地质地貌资源和科学价值。如果地质公园管理者计划提高地质公园管理和相关宣传保育经费，门票金额也因此会提高，您会愿意支付吗？
    □ 愿意 □ 不愿意
19. 如果愿意，您愿意为丹霞山地质旅游支付多少钱？__________
20. 如果不愿意，请问为什么：
    - □ 这个环境属于公众，所以我不需要支付
    - □ 我觉得这个旅游目的地不值得花钱去游览
    - □ 政府应当为我们支付
    - □ 我不愿意支付因为门票已经贵到超出接受范围
    - □ 其他原因:

    ____

第五部分 满意程度

陈述		十分不满意	比较不满意	不确定	比较满意	完全不满意
1	独特的地质地貌					
2	有吸引力的山地					
3	动植物品种多样					
4	整个景区景观					
5	方便的公共交通					
6	位置显示清楚并实用的地图					
7	清楚的游览指示牌					
8	地质步道的保养和维护					
9	有趣的信息板					
10	洗手间方便前往					
11	足够的安全设施（如护栏、警示牌）					
12	关于岩石和生物物种有充足的教育咨询					
13	关于岩石和生物物种有充足的保育信息					
14	综合的保育政策					
15	总体满意度					

第六部分 个人信息

性别	☐男 ☐女	
年龄	☐ 18-29 ☐30-39 ☐40-49 ☐50-59 ☐60 岁及以上	
教育背景	☐ 小学及以下 ☐中学 ☐大专 ☐本科 ☐研究生及以上	
职业	☐ 失业人士 ☐受雇人士 ☐家庭主妇 ☐学生 ☐退休人士 ☐ 其他 (请列出：______________________)	
月收入 (人民币)	☐ 没有收入 ☐ 极低收入 ☐ 较低收入 ☐ 中等偏低收入	☐ 中等收入 ☐ 中等偏高收入 ☐ 高收入 ☐ 很高收入

问卷完成，谢谢您的参与！