

Research on the Influence of Cultural Distance, Emotional Attachment and Tourism Expectation of Tourists in Over-tourism Destinations —an Empirical Study Based on Dunhuang, China



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Abstract: With the rapid development of tourism in global cultural heritage sites, the problem of declining tourist satisfaction and experience quality caused by over tourism has become increasingly prominent, which has become a key issue that needs to be solved urgently for the sustainable development of tourism destinations. Based on the field survey data of Dunhuang tourists, this study studies the influence of cultural distance, emotional attachment and tourism expectation of tourists in over-tourism destinations, analyzes the mediating effect between various variables, and divides them into three groups according to different places of residence for heterogeneity analysis. The following conclusions are drawn : tourists ' perceived cultural distance has a positive impact on tourist satisfaction ; emotional attachment plays an intermediary role in the influence of tourists ' perceived cultural distance on tourists ' satisfaction. Tourism expectation plays an intermediary role between tourists ' perceived cultural distance and tourists ' satisfaction. Tourism expectation plays an intermediary role between tourists ' perceived cultural distance and emotional attachment. Tourism expectation plays an intermediary role between tourists ' place emotional attachment and tourists ' satisfaction. There is significant regional heterogeneity in the effect of tourists ' perceived cultural distance on tourist satisfaction. There are significant regional differences in the effect of emotional attachment on tourist satisfaction. There are significant regional differences in the effect of tourism expectations on tourist satisfaction. The purpose of this paper is to provide reference for the sustainable development of the same type of over-tourism destinations in the world and Dunhuang tourism destinations through the relevant theoretical research on cultural distance, emotional attachment and tourism expectation.

Keywords: folk tourism , cultural distance , emotional attachment , satisfaction , tourist expectations

1.Introduction

Culture is increasingly regarded as an important driving force of tourism (Patuelli et al., 2014). It plays an important role in tourists ' perception of destinations during travel. The impact of tourists ' satisfaction in the process of tourists ' experience is an emerging and important issue (Wang Jianguo et al., 2021). Different tourists have different needs for cultural tourism experience activities and processes (Borowiecki & Castiglione, 2014). Cultural exploration is one of the main motivations of modern tourists' leisure tourism (Crompton, 1979). The existence of regional differences is the key to attracting tourists to participate in the experience. The diversion of travel agencies provides tourists with a better tourism experience (Pakan & Purwandani, 2022). The residence time of tourists increases with the increase of cultural distance (Jackman et al., 2020), and also has an impact on characteristic tourist destinations such as medical tourism destinations (Esiyok et al., 2017) and heritage tourism destinations. Tourist flow is a social

network relationship of factor flow dominated by tourists (Jing Yiyi, et al., 2022). Super-scale tourist flow will have an important impact on the sustainable development of tourist destinations. Tourist flow is an important channel for resource transmission between destinations and tourist sources (Liu, et al., 2010). Among them, cultural exchanges such as clothing, diet and living habits are also accompanied by this process, which will also have an impact on their primitive perception and authentic experience. The establishment of the Ministry of Culture and Tourism of China in 2018 provides an opportunity for the integration and development of culture and tourism, and cultural tourism destinations have become hot spots pursued by tourists. For example, Dunhuang City received 20.92 million Chinese and foreign tourists in 2024, a year-on-year increase of 24.3 %. Dunhuang tourism has become a tourist destination that domestic and foreign tourists are constantly yearning for, and constantly attracts large-scale tourists to participate in the system. It has become one of the important destinations of cultural tourism and has an important position and role in the cultural tourism of the Silk Road. Tourists play an

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important role in the process of this tourist flow, which plays an important role in the process of spatial flow in cultural exchange (Zheng Mi, et al., 2022) significantly affects tourists' travel decisions and destination choices (Ma Yong, Tong Yun., 2019) and helps to enhance tourists' cultural perception of the destination (XU Cuirong, et al., 2020). Feeling cultural authenticity is considered to be the main motivation and core experience for tourists to visit ethnic tourist destinations (Yu Yifeng, et al., 2017). Among them, folk tourism can make tourists feel cultural distance to the term in the 'Collins English Dictionary', which is expressed as 'the phenomenon that popular tourist destinations exceed extent' (Yang Lijuan., 2003). There is a great relationship between tourism perception and satisfaction (Yin Zhangxin et al., 2018). After a large-scale tourist flow enters a destination, there will be a certain trend of excessive tourism. Excessive tourism is a phenomenon that Greg Dickinson proposed in 2018 to include over tourism as a new or attractions are swallowed up by tourists in an unsustainable way'. The World Tourism Council (WTTC) has not used the term 'over tourism' so far, and only 'overcrowding' is used in all its reports. Over tourism can also be understood as the scale of tourists exceeding their carrying capacity in a scenic spot or region, which will have a negative impact on the economic, social and ecological sustainable development of the region where the destination is located. The research on excessive tourism has also changed from the over-exploitation of tourism resources to the carrying capacity of tourists. With the short-term large-scale inflow of a regional tourist flow, it will have an excessive negative impact on the local community or the natural environment. For example, hot topics such as Zibo barbecue, Erbin frozen pear, Tianshui spicy hot and Anwan Qinqiang formed in China in 2023 will form hot topics in a short time, which can attract large-scale people to enter the destination for sightseeing and experience in a short time. According to the data provided by Tik Tok Life Service, in the first two weeks of March, the number of spicy hot orders in Tianshui increased by nearly 180 % month-on-month, while the number of spicy hot orders in Gansu Province also showed an upward trend, with a month-on-month increase of 62 %. As a popular gathering place for spicy hot and hot, the average daily flow of 'Tianshui Siheyuan' is as high as 24,300 people, and the peak is an astonishing 45,100 people. It can be seen that the hot topics of tourist destinations can become the attraction points for tourists to participate in the experience, but how to provide high-quality cultural expression and tourism products in large-scale tourism flows has become an urgent problem to be concerned.

Cultural distance contributes to the formation of tourism flow, and reasonable tourism flow is easier to promote cultural exchange. China is rich in cultural resources and natural resources. The differences in cultural forms such as dietary differences, clothing differences, and ethnic differences between different provinces (regions) and regions can promote the flow of tourists in different regions. Physical distance directly affects the tourist experience process, but cultural distance, as a supplement to physical distance, further explains the tourist flow (Qian J.W., et al., 2018). The impact on the relationship between cultural distance and tourism in China is mainly focused on the comparison of Chinese and foreign tourists (Zheng Songyi, et al., 2022), the perceived differences of Chinese tourists to South Africa as the destination (Pan Li, et al., 2021), and the impact on the cultural differences of China's inbound tourism market. The comprehensive effect of cultural differences in 16 countries and regions in North America, Europe and Asia on the impact of inbound tourism (Patuelli R., et al., 2014); taking the inbound tourism market of Hainan Province as an example, this paper analyzes the impact of departure tax rebate policy, physical distance and cultural distance on the scale of inbound tourism (Zhang Yingwu, et al., 2018); the influence of 15 popular tourist source countries such as Indonesia and Malaysia on China's inbound tourism market under the influence of cultural distance (Yi Zhongming, et al., 2020); from the comprehensive effect of cultural distance and geographical distance, administrative distance, geographical distance and economic distance on the impact of China's inbound tourism market (Yang Yang, et al., 2022); it affects inbound tourism trade in destination countries by alleviating incomplete information, narrowing cultural distance and shaping international image (Cheng Yinying, et al., 2022). As the process of experience is not only the focus on the scenic spot as the destination, but also gradually tends to change the urban destination based on the comprehensive attraction of the city, the measurement of the cultural elements of the destination becomes the key. The emergence of the phenomenon and concept of excessive tourism will have a certain impact on the tourist source groups brought by cultural distance. In order to realize the sustainable development of regional tourism destinations, we will continue to pay attention to the development of this phenomenon.

Based on the individual characteristics of Chinese domestic tourists, this paper takes Dunhuang City, China as a case study area, collects research data by issuing questionnaires, constructs a research model of intermediary role, demonstrates the influence mechanism of cultural distance on tourists' emotional attachment, tourism expectation and

satisfaction in the process of tourism experience in over-tourism destinations, and puts forward the path of sustainable development of over-tourism destinations under the background of cultural influence. The contribution of this paper mainly has the following four aspects. The first is to enrich the research of cultural distance theory in tourism, especially the verification of this theory in the development of China's tourism industry. The second is to put forward the mediating role of emotional attachment and tourist expectation in cultural distance on tourist satisfaction of excessive tourist destinations. The third is to provide a typical case study on the influence mechanism of cultural distance on tourist satisfaction. The fourth is to propose a path study on the sustainable development of excessive tourism destinations based on the theory of tourism cultural distance, with a view to providing reference for the sustainable development of tourism in the same type of regions as global and Dunhuang tourism destinations.

2 Theoretical Framework and Research Hypothesis

2.1 Cultural distance and tourist satisfaction

Cultural distance perception is mainly studied from the national level and the individual level, and the research on the individual level is mainly based on the tourists' perception of cultural distance. Cultural distance has been concerned by anthropology since the beginning of the 20th century, mainly cultural diversity and cross-cultural comparison. Interregional cultural differences produce cultural distance, which is introduced into the field of tourism research (McIntosh R W & Goeldner C R, 1984). Tourists are easily affected by a variety of distances during the tour, among which cultural distance can be an important factor to stimulate tourism motivation and destination selection (Ng S I, Lee J A & Soutar G N, 2007; Goeldner C R & Ritchie J R B, 2012; Liu H B, 2014). The theory of tourism motivation generally believes that 'the greater the cultural distance, the more it can meet the needs of tourists for novelty and difference, and the stronger the attraction to tourists' (Ma Yong & Tong Yun, 2019), but the difficulty of realizing the tourism process will increase (Wang Gongwei, 2019). Some scholars have also shown a positive correlation in the results of the study of cultural distance. For example, in the study of Xinjiang in China, the overall satisfaction of tourists is positively correlated with cultural distance, that is, the greater the cultural distance between the tourist area and Kashgar (Liu Qianqian, 2011). Cultural distance has a negative effect on tourist satisfaction, such as Crotts J C, McKercher B. (Crotts & McKercher, 2006), Weiermair K, Fuchs M. (Weiermair & Fuchs, 2000), Leung D, Woo G J, Ly T

P. (Leung et al., 2013). According to the existing research, cultural distance is divided into four parts: life cultural distance (Jackman M. et al., 2019), folk cultural distance (Ma Yong & Tong Yun, 2019), production cultural distance (Qian J. W. et al., 2018), and shared space cultural distance (Ng S I & Lee J A, 2007). Accordingly, the following assumptions are made:

H1: Tourists' perceived cultural distance has a positive impact on satisfaction.

H1a: Tourists' perception of life cultural distance has a positive impact on satisfaction.

H1b: Tourists' perception of folk cultural distance has a positive impact on satisfaction.

H1c: Tourists' perception of cultural distance of production has a positive impact on satisfaction.

H1d: Tourists' perception of cultural distance of shared space has a positive impact on satisfaction.

2.2 The mediating role of emotional attachment

Tourists' perceived cultural distance has a positive impact on emotional attachment. At the same time, tourism also shortens the cultural distance, psychological distance and emotional distance (Cheng Shuai, 2023). According to the theory of emotional attachment, tourists establish deep emotional connections with tourist destinations through culture, history or memory. Tourists' emotional attachment is strengthened by cultural memory, and the change of memory space has a continuous impact on tourists' emotional attachment (Gao Ping & Jin Cheng, 2024). Local theory generally believes that the uniqueness of the region in the natural, historical, cultural and other dimensions of how to shape the tourism attraction and tourist experience, the uniqueness of local culture, promote tourists to participate in local traditional cultural activities, and stimulate tourists' emotional attachment to urban cultural landscape (Wang Hao, 2025). What foreign tourists feel is a kind of culture different from their habitual residence. In the process of visiting, through the embodied experience of tourists, they get the sublimation of emotion, produce emotional attachment to local culture, and then form exogenous local identity (He Yinchun et al., 2024). In this process, tourists produce emotional attachment and cultural resonance with the deepening of cognition (Tian Meiling et al., 2024). Cultural distance has a positive effect on emotional attachment. Some scholars have shown that cultural distance is related to the emotional tendency of countries along the "Belt and Road." There is an inverted U-shaped curve relationship between cultural distance and emotional tendency (Zhang Ruo-xing, 2023). Appropriate cultural distance can promote positive emotional tendency (Niu Huayong et al., 2024).

Emotional attachment has a positive impact on tourist satisfaction. There is a mutually reinforcing relationship between tourist satisfaction and tourists'

emotional attachment (Qian Shuwei et al., 2010). Emotional attachment in tourism usually refers to the deep connection between tourists and tourist destinations based on emotion, cognition and behavior, which includes two dimensions: place dependence and place cognition. Place dependence emphasizes the functional attachment between people and places, and place identity emphasizes the emotional attachment between people and places. Both of them have an impact on tourist satisfaction through the emotional attachment dimension. (Chen Wei et al., 2024). The uniqueness of the place will enable tourists to form a strong emotional connection with the tourist destination and the two dimensions of place attachment (place identity and place dependence) have a significant positive impact on tourist experience satisfaction (YUKSEL A et al., 2010). Therefore, emotional attachment has a significant direct impact on tourism satisfaction (Gao Jun & Ma Yaofeng, 2012). Liu Chunyan et al. (Liu Chunyan et al., 2014) found that the degree of emotional attachment of tourists has a direct impact on their satisfaction. Tang Wenyue et al. (Tang Wenyue et al., 2007) also showed that emotional attachment has a positive impact on tourist satisfaction by analyzing the characteristics of tourists' sense of place in Jiuzhaigou. Accordingly, the following assumptions are made:

H2: Emotional attachment plays an intermediary role in the influence of tourists' perceived cultural distance on tourists' satisfaction.

H2a: Emotional attachment plays an intermediary role in the influence of tourists' perception of life cultural distance on tourists' satisfaction.

H2b: Emotional attachment plays an intermediary role in the influence of tourists' perception of folk cultural distance on tourists' satisfaction.

H2c: Emotional attachment plays an intermediary role in the influence of tourists' perception of production cultural distance on tourists' satisfaction.

H2d: Emotional attachment plays an intermediary role in the influence of tourists' perception of cultural distance of shared space on tourists' satisfaction.

2.3 The Mediating role of tourism expectation

2.3.1 Tourists' perception of cultural distance and emotional attachment

According to Fromm's Expectancy Theory, the travel motivation of tourists when they go out to play is expressed as Travel Motivation, that is, the product of Travel Expectancy and Travel Valence, which is expressed as $TM = TE \times TV$. Among them, the theory of tourism expectation generally believes that tourism expectation is the psychological expectation

of tourists on the possibility of realizing tourism goals caused by tourism motivation, including the prediction of destination resources, services, cultural experience and other dimensions. Tourists will comprehensively process the perception of tourism experience based on their own cultural background, tourism expectation and past experience (Luo Ming & Luo Rong, 2025). Tourism motivation theory emphasizes that certain cultural differences and mystique are also important stimuli that determine tourists' participation and involvement. Cultural distance is an important stimulating factor for tourists. When place identity is at a high level and emotional attachment is at a high level, it means that the similarity between tourists' values and destination culture is too strong. Therefore, in this context, a high degree of cultural homogeneity will hinder tourists' intrinsic motivation and tourism expectations such as curiosity and difference, and then inhibit the generation of tourism involvement such as passion and exciting experience in tourism activities. (Zhao Jin-jin & Liu Bo, 2024). Accordingly, the following assumptions are made:

H3: Tourism expectation plays an intermediary role between tourists' perceived cultural distance and emotional attachment.

H3a: Tourism expectation plays an intermediary role between tourists' perception of life cultural distance and emotional attachment.

H3b: Tourism expectation plays an intermediary role between tourists' perception of folk cultural distance and emotional attachment.

H3c: Tourism expectation plays an intermediary role between tourists' perception of production cultural distance and emotional attachment.

H3d: Tourism expectation plays an intermediary role between tourists' perception of cultural distance and emotional attachment in shared space.

2.3.2 Tourists' place emotional attachment and tourist satisfaction

According to McIntosh's four types of motivation models, cultural motivation is based on the desire for knowledge and exploration, the pursuit of cognitive experience of foreign culture, historical heritage or art form. In the path of incomplete cultural identity, cognition achieves behavioral identity through tourism expectation and tourism emotion (Jiang Yajun et al., 2021). Tourism expectation theory generally believes that tourism expectation is the psychological expectation of tourists on the possibility of realizing tourism goals caused by tourism motivation, including the prediction of destination resources, services, cultural experience and other dimensions. If tourism

development lacks emotional immersive tourism experience projects that tourists personally participate in, the emotional needs of contemporary tourists are not met. Most contemporary tourists expect to acquire some skills and knowledge through tourism, feel the unique regional characteristics and profound cultural heritage of different places, and thus get spiritual satisfaction(Chen Yantao et al., 2023). Accordingly, the following assumptions are made :

H4:Tourism expectation plays an intermediary role between tourists ' place emotional attachment and tourists ' satisfaction.

2.3.3 Tourists ' perceived cultural distance and tourist satisfaction

The tourism valence in the expectation theory is the value evaluation of tourism experience to meet individual needs, which can be explained by tourist satisfaction. The study of tourism experience under the influence of cultural distance .In the process of tourism, field and situational factors can only produce some ' presence ' experience intervention on tourism experience, while tourism expectation and preference are also important influencing factors of tourism experience. (Wang Hongyan et al., 2023)Expectancy-Disconfirmation Theory is the core theory to explain the formation mechanism of individual satisfaction. It emphasizes the influence of the difference between actual experience and expectation on satisfaction. It holds that tourist

satisfaction is a kind of emotional state, which is the subjective feeling of tourists after comparing their own tourism expectation with the actual tourism experience(Peng Runhua&Chang Jing , 2023).Therefore, tourism expectation has an important influence on tourist satisfaction. In order to maintain a high degree of satisfaction and destination loyalty of tourists, traditional villages should consider the quality of tourist experience in a prominent position in the process of developing tourism, and do a good job in the ' subtraction ' of tourist expectations and the ' addition ' of demand satisfaction(Wu Wenzhi&Tang Pei, 2022). Accordingly, the following assumptions are made :

H5:Tourism expectation plays an intermediary role between tourists ' perceived cultural distance and tourists ' satisfaction.

H5a:Tourism expectation plays an intermediary role between tourists ' perception of life cultural distance and tourists ' satisfaction.

H5b:Tourism expectation plays an intermediary role between tourists ' perception of folk culture distance and tourists ' satisfaction.

H5c:Tourism expectation plays an intermediary role between tourists ' perception of production cultural distance and tourists ' satisfaction.

H5d:Tourism expectation plays an intermediary role between tourists ' perception of cultural distance in shared space and tourists ' satisfaction.

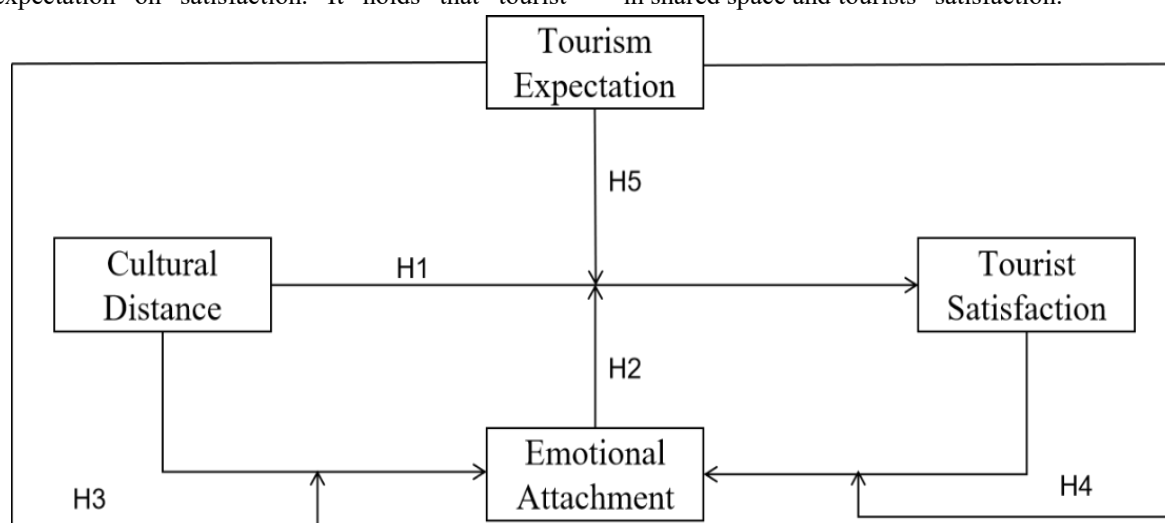


Fig. 1 Research framework
(Figure 1 is placed after the paragraph of 1.3.3)

3 Questionnaire Design and Data Collection Design

3.1 Introduction of the study area

Dunhuang City is located in the northwest of Gansu Province, the northern edge of the Qinghai-Tibet Plateau, and the westernmost end of the Hexi Corridor. It is a county-level city under the jurisdiction of Gansu Province administered by Jiuquan City(Hong Yan et al., 1994).By the end of

2023, the total area of Dunhuang City was 267,000 square kilometers, with a resident population of 182,400 people.Dunhuang was called Shazhou and Guazhou in ancient times(Yao Henglu, 2016),During the period of Emperor Wu of the Western Han Dynasty, Zhang Qian was sent to the Western Regions to open the Silk Road and set up Dunhuang Prefecture in the sixth year of Emperor Wu of the Han Dynasty.In September 1949, Dunhuang was

liberated, and the Dunhuang County People's Government was established on October 7 of the same year, which was under the jurisdiction of Jiuquan area. In September 1987, Dunhuang County was abolished and Dunhuang City was established (Zhang Yongquan et al., 2024). Dunhuang's economy is dominated by agriculture, followed by tourism. In 2023, Dunhuang's gross domestic product reached 97.2 billion yuan, an increase of 9.3% over

the previous year. Among them, the added value of the primary industry accounts for 13.5% of the regional GDP, the added value of the secondary industry accounts for 20.1%, and the added value of the tertiary industry accounts for 66.4%. According to the resident population, the annual per capita GDP is 52,914 yuan (People's Government of Dunhuang City, 2025).

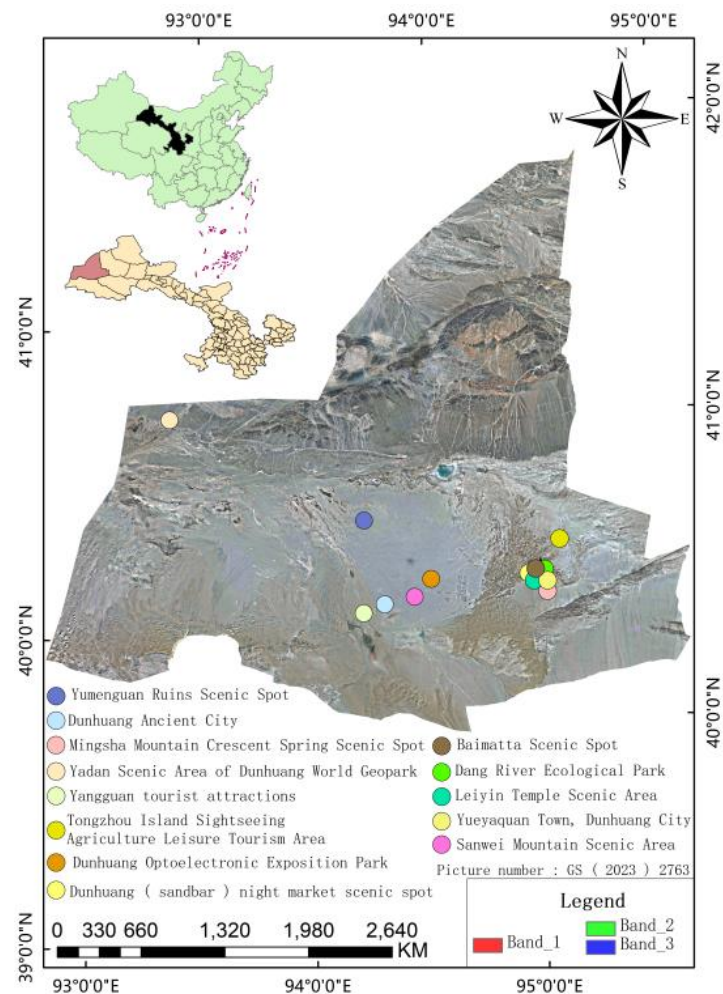


Fig. 2 Dunhuang City Scenic Area Location Distribution Map.
(Figure 2 is placed between two paragraphs of 2.1)

In recent years, Dunhuang, as a cultural treasure on the Silk Road, has become a popular tourist destination, attracting large-scale tourists at home and abroad to continue to participate in the experience, bringing economic benefits, but also facing the challenges of natural ecology and cultural ecology brought by excessive tourism. According to the data, the single-day reception of Mogao Grottoes in the summer of 2024 reached 12,000 people, far exceeding its most reasonable daily carrying capacity of 6,000 people; The average daily reception of the Moya Spring Scenic Area in Mingsha Mountain is

nearly 30,000 people, which also exceeds the best tourist capacity of the scenic area, resulting in a certain impact on the cognition of cultural symbols such as Dunhuang Mogao Grottoes during the visit of tourists. Over-tourism is making Dunhuang fall into the 'experience dilemma' -tourists spend higher costs but get a shallower experience. How to find a balance between over-tourism and tourist satisfaction and explore the impact mechanism between the two is an urgent problem for Dunhuang and more over-tourism destinations. It is also a key issue that needs to be solved urgently to achieve its sustainable

development.

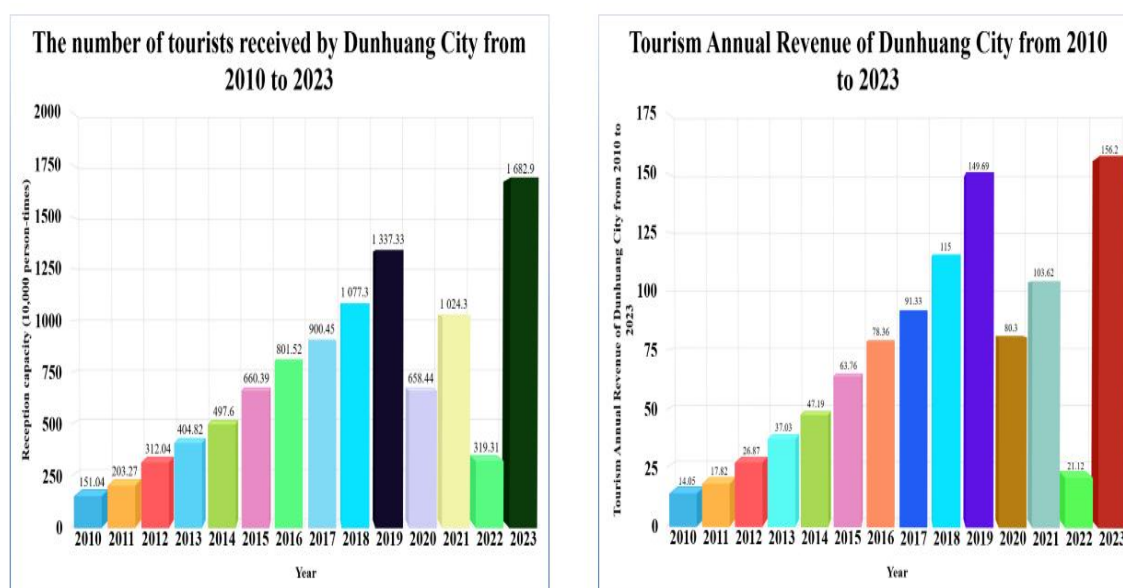


Fig. 3 Statistics of tourist reception and tourism income in Dunhuang city from 2010-2023
(Figure 3 is placed after the end of 2.1.)

3.2 Questionnaire design and collection

Cultural distance is the tourists' perception of cultural distance.(hereinafter referred to as TPCD).The questionnaire is divided into two parts:the basic information of tourists and the concept measurement scale. All the measurement indicators are measured by the Likert five-level scale(1 means completely disagree, 5 means completely agree).The tourist perceived cultural distance scale is based on the perceived cultural distance scale of Babiker et al. (Babiker et al., 1980).At the same time, the measurement items of similar constructs such as sociocultural adaptation and cultural novelty were used for reference,combined with the nine indicators of Chinese domestic tourists' lifestyle, material conditions, language, climate environment, religious beliefs, cultural retention, leisure and entertainment, values and social methods(Wang Jianguo et al., 2022) and the replacement of her conditions unchanged 9 dimensions and 87 indicator(Zheng Mi et al., 2022),this paper combines the development characteristics of the tourism industry and the needs of tourists to modify 9 dimensions and 40 indicators for lifestyle, material basis, climate environment, religious beliefs, cultural retention, leisure and entertainment, values and social methods.

Tourists' measurement of tourist destinations is mainly measured by Likert five-level scale (1 means very disagree, 5 means very satisfied). Based on the existing research(Zhang Qian, 2018;Nan Jianfei & Zhao Lili., 2006;Dong Guanzhi & Yang Fengying, 2005),the measurement of tourists satisfaction can be

measured from 10 dimensions:tourism image, tourism landscape,transportation service,catering service,accommodation service,shopping and consumption service,entertainment experience,tourism safety,digital technology application,management and service.The emotion of place is mainly manifested through emotional attachment(Zhang Huili & Xia Xianli, 2022;Liu Xiaotong et al., 2021),the attachment emotion of tourists to tourist destinations is an important factor to stimulate tourists to revisit(Zhang Liangquan et al., 2022)[65],the research process of place attachment emphasizes the emotional relationship between people and places(Tan g Wenye, 2007),for the emotional attachment in the process of tourism,the measurement scales of Thomson(Thomson, 2006),Jiang Yan(Jiang Yan, 2013) and Wang Liming(Wang Liming et al., 2021)are used for reference,including three dimensions of identity,love and dependence,a total of 12items,mainly considering the consumption in the process of tourists' tourism experience.The expectations of tourists through the challenge,value(Huang Zixuan et al., 2018),achievement(Li Fei, 2007) 3 dimensions,a total of 9 items,to highlight the realization of self-worth.

3.3 Analysis of sample characteristics

From July to August 2024, the research team conducted in-depth research on Dunhuang Mingsha Mountain Crescent Spring Scenic Spot, Yangguan tourist attractions, Yumenguan Ruins Scenic Spot, and Yadan Scenic Area of Dunhuang World Geopark. A total of 300 questionnaires were distributed and

287 valid questionnaires were collected. According to the demographic variables shown in Table 1, from the perspective of gender variables, the proportion of men and women in the samples selected in this study is basically balanced, and female tourists are slightly more than male tourists. In terms of age groups, young tourists (especially the 18-34 age group) dominate the overall tourists in this study. Tourists aged 18 to 25 accounted for 34.49 %, and tourists aged 26 to 34 accounted for 24.39 %. From the perspective of education level, college and undergraduate level tourists accounted for the largest proportion. From the perspective of income, tourists with monthly income ≤ 3000 yuan and 5000-6999 yuan account for a large proportion. From the

perspective of occupational distribution, students become the main tourist group. In terms of travel mode choice, 74.91 % of tourists are free to travel, reflecting that tourists are more inclined to choose their own travel arrangements. In summary, the gender ratio of tourists in Dunhuang City is basically balanced, mainly young and highly educated groups, the economic situation is relatively stable, and most tourists choose to travel freely. In addition, tourists younger than 18 years old who need to pay attention to are mainly family-based parent-child tours. When filling in, parents mainly guide family members younger than 18 years old to fill in, and the characteristics of family travel are more obvious.

Table 1 Characteristics of Tourists Surveyed in Dunhuang City

Category	Variable	Percentage (%)
Gender	Male	49.48
	Female	50.52
Age	<18 yr	11.85
	18–25 yr	34.49
	26–34 yr	24.39
	35–44 yr	17.07
	45–64 yr	8.72
	>65 yr	3.48
	High school or below	19.86
Educational background	College undergraduate and junior college	67.60
	Postgraduate	12.54
	≤ 3000 yuan	31.01
Monthly income	3001–4999 yuan	18.12
	5000–6999 yuan	34.49
	7000–8999 yuan	11.33
	≥ 9000 yuan	5.05
	Customer service staff	1.74
Profession	Student	42.16
	Other	20.56
	Salesman	6.27
	Teacher	6.97
	Operating personnel	1.74
	Administrator	1.74
	Office salaries	2.79
	Civilian staff and other personnel	3.14
	Professional skill	12.89
Travel modes	Free travel	74.91
	Travel agency	25.09

4 Research Result

4.1 Exploratory factor analysis

Before conducting exploratory factor analysis, reliability and validity tests are required. The Cronbach 's α coefficient of the tourism experience scale is 0.979, indicating that the reliability of the questionnaire is very good and has good internal consistency. The KMO value is 0.975. The results of factors were selected and named as cultural distance, tourist satisfaction. According to the results of exploratory factor analysis, the load of 41 factors was

Bartlett 's sphericity test show that the significance P value is 0.000***, which is significant at the level. The original hypothesis is rejected, and there is a correlation between the variables. The factor analysis is effective and the degree is suitable. It shows that exploratory factor analysis can be carried out. Exploratory factor analysis was carried out on the 41 factors designed in the questionnaire. Four main emotional attachment, tourism expectation and 0.697~0.873, and the variance contribution rate was 59.738 % ~ 73.383 %.

4.2 Confirmatory factor analysis

On the basis of exploratory factor analysis, the confirmatory factor analysis was carried out. The results showed that the fitting indexes GFI (Goodness of Fit Index), RMSEA (Root Mean Square Error of Approximation), RMR (Root Mean Residual), CFI (Comparative Fitting Index), NFI (Normalized Fitting Index), NNFI (Non-Normalized

Fitting Index) and χ^2/df (chi-square degree of freedom ratio) were 0.86, 0.048, 0.034, 0.939, 0.860, 0.934 and 1.664, respectively, which all reached the ideal value standard, indicating that the model and the observed data were well matched, which can be seen from table 2.

Table 2 Results of Exploratory Factor Analysis and Confirmatory Factor Analysis

Latent variable	Measurement items	Item mean	exploratory factor analysis		confirmatory factor analysis						
			factor loading	variance contribution rate/%	NFI	NNFI	z	S.E.	P	CR	AVE
Life cultural distance	Dining habits	3.902	0.788	64.341	1.000	0.700	-	-	-	0.861	0.555
	Clothing style	3.965	0.828		1.143	0.767	12.509	0.091	0.000***		
	life rhythm	3.930	0.793		1.051	0.724	11.833	0.089	0.000***		
	routine	3.976	0.802		1.099	0.763	12.444	0.088	0.000***		
	taboos in life	3.969	0.801		1.196	0.764	12.464	0.096	0.000***		
folk cultural distance	Attitude towards ancestors	4.126	0.863	73.383	1.000	0.826	-	-	-	0.879	0.645
	Attitude towards faith	4.080	0.857		1.021	0.795	15.843	0.064	0.000***		
	Ways of Showing Traditional Culture	4.167	0.873		0.954	0.805	16.137	0.059	0.000***		
	Treat the customs of the local people	4.080	0.833		0.936	0.786	15.566	0.060	0.000***		
	Cost of living and prices	3.634	0.787	60.742	1.000	0.695	-	-	-	0.835	0.504
production cultural distance	Architectural style and decorative pattern	4.049	0.772		0.862	0.710	11.399	0.076	0.000***		
	Accommodation environment and facilities conditions	3.707	0.791		0.921	0.695	11.168	0.082	0.000***		
	Transportation facilities and convenience	3.812	0.798		0.902	0.718	11.510	0.078	0.000***		
	Commodity richness and convenience	3.840	0.747		0.908	0.739	11.831	0.077	0.000***		
	Local people 's attitude towards strangers such as tourists	3.882	0.852	70.991	1.000	0.751	-	-	-	0.795	0.563
Shared space cultural distance	Local people attach importance to environmental protection.	4.056	0.843		1.001	0.770	13.618	0.074	0.000***		
	Local people 's attitude towards tourists ' consumption	3.885	0.833		1.020	0.732	12.863	0.079	0.000***		
	tourism image	4.010	0.802	59.738	1.000	0.797	-	-	-	0.925	0.554
	tourism landscape	4.024	0.800		0.933	0.798	15.416	0.061	0.000***		
	scenic traffic	3.958	0.697		0.736	0.652	11.901	0.062	0.000***		
tourist satisfaction	food and beverage service	3.777	0.749		0.891	0.708	13.174	0.068	0.000***		
	accommodation service	3.812	0.792		0.972	0.759	14.417	0.067	0.000***		
	shopping service	3.854	0.786		0.894	0.737	13.883	0.064	0.000***		
	entertainment experience	3.983	0.792		0.916	0.749	14.172	0.065	0.000***		
	tourism safety	4.105	0.748		0.826	0.714	13.324	0.062	0.000***		
	application of digital technology	4.045	0.773		0.877	0.736	13.859	0.063	0.000***		

	management services	4.052	0.783		0.885	0.766	14.603	0.061	0.000***		
	Unique personality style perception	3.934	0.823	65.904	1.000	0.790	-	-	-	0.914	0.604
	Unique Lifestyle Perception	3.902	0.796		0.800	0.754	14.163	0.056	0.000***		
	Communication comfort perception	4.010	0.784		0.832	0.745	13.943	0.060	0.000***		
emotional attachment	Pleasure perception in tourism process	3.983	0.820		0.921	0.801	15.318	0.060	0.000***		
	Tourism process communication convenient perception	4.003	0.812		0.834	0.774	14.645	0.057	0.000***		
	Tourism process improves emotional attribution	3.962	0.812		0.837	0.765	14.414	0.058	0.000***		
	Tourism process Local people are enthusiastic	3.986	0.834		0.921	0.802	15.348	0.06	0.000***		
	The challenge of self-realization	3.875	0.763	63.860	1.000	0.739	-	-	-	0.929	0.591
	Gain unparalleled freshness	3.983	0.771		0.908	0.748	12.945	0.070	0.000***		
	Self-satisfaction cognition	4.014	0.838		0.994	0.811	14.161	0.070	0.000***		
tourism expectation	Realize their own hobbies	3.983	0.795		0.968	0.773	13.431	0.072	0.000***		
	Realize the experience value of self	3.965	0.829		1.033	0.798	13.915	0.074	0.000***		
	Get the best satisfaction	4.003	0.832		0.977	0.795	13.852	0.071	0.000***		
	Get the best sense of happiness	4.024	0.803		0.902	0.777	13.502	0.067	0.000***		

Remark: ***, **, * represents the significance level of 1%, 5%, 10% respectively

In this study, the discriminant validity of the model was tested by Pearson correlation coefficient and average variance extraction (AVE) square root (Table 3). The data analysis shows that the AVE square root values of all latent variables are higher than 0.7, which meets the Fornell-Larcker

standard (Henseler et al., 2015). Among them, the validity of folk culture distance is relatively good, and the square root extracted by the average variance corresponding to each first-order latent variable is greater than the correlation coefficient between this variable and other first-order latent variables.

Table 3 Discriminant Validity : Pearson Correlation and AVE Root Value

	Life cultural distance	folk cultural distance	production cultural distance	Shared cultural distance	tourist satisfaction	emotional attachment	tourism expectation
Life cultural distance	0.745						
folk cultural distance	0.854 (0.000***)	0.803					
production cultural distance	0.791 (0.000***)	0.723 (0.000***)	0.710				
Shared cultural distance	0.779 (0.000***)	0.777 (0.000***)	0.767 (0.000***)	0.750			
tourist satisfaction	0.770 (0.000***)	0.744 (0.000***)	0.827 (0.000***)	0.778 (0.000***)	0.744		
emotional attachment	0.754 (0.000***)	0.734 (0.000***)	0.773 (0.000***)	0.780 (0.000***)	0.866 (0.000***)	0.777	
tourism expectation	0.759 (0.000***)	0.722 (0.000***)	0.773 (0.000***)	0.791 (0.000***)	0.816 (0.000***)	0.875 (0.000***)	0.769

Remark: ***,**,*,represents the significance level of 1%,5%,10% respectively.The diagonal number is the root number of the factor AVE.

4.3 Analysis of effect

4.3.1 Analysis of the mediating effect of emotional attachment

(1)The mediating effect of emotional attachment on cultural distance and tourist satisfaction

As shown in table 4, in the first step of the test, the independent variable cultural distance has a significant positive impact on the dependent variable tourist satisfaction ($\beta=0.855$, $p<0.001$), indicating that the total effect is established ; in the second step of the test, the independent variable cultural distance has a significant positive impact on the intermediary variable emotional attachment ($\beta=0.829$, $p<0.001$);in the third step of the test, the independent variable cultural distance has a significant positive impact on the dependent variable tourist satisfaction

($\beta=0.443$, $p<0.001$), and the intermediary variable emotional attachment also has a significant positive impact on the dependent variable ($\beta=0.497$, $p<0.001$). Therefore, the mediating role of emotional attachment in the model is established. At the same time, the bias-corrected Bootstrap method was used for verification. The number of repeated sampling was set to 5000 times, and the confidence interval (Boot CI) was 95 %. The mediating effect interval of emotional attachment does not contain 0, and the mediating effect is significant. Specifically, the total effect c is significant, and a and b are significant, the direct effect c' is significant, and $a * b$ and c' are both positive, indicating that emotional attachment has a partial mediating effect.

Table 4 Results of Mediating Effect Analysis

	tourist satisfaction					emotional attachment					tourist satisfaction				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.117**	0.023	5.006	0.000	-	0.109**	0.026	4.135	0.000	-	0.065**	0.020	3.207	0.001	-
cultural distance	0.851**	0.031	27.796	0.000	0.855	0.868**	0.035	25.061	0.000	0.829	0.441**	0.046	9.503	0.000	0.443
cultural distance											0.473**	0.044	10.657	0.000	0.497
R2			0.731					0.688					0.807		
adjust R2			0.730					0.687					0.806		
F value	F (1,285)=772.602,p=0.000					F (1,285)=628.066,p=0.000					F (2,284)=595.661,p=0.000				

* p<0.05 ** p<0.01

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c'direct effect	inspection conclusion
cultural distance										
=>emotional attachment	0.851**	0.868**	0.473**	0.410	0.068	6.040	0.000	0.272 ~ 0.542	0.441**	partial mediation
=>tourist satisfaction										

Remark: * p<0.05 ** p<0.01,bootstrap type = bias correction bootstrap method

(2) The mediating effect of emotional attachment on the variables of cultural distance and tourist satisfaction

Further analyze the mediating effect of emotional attachment and explore its impact on tourist satisfaction in cultural distance. The Bootstrap method was used for analysis, and the number of repeated sampling was set to 5000 times, and the confidence interval (Boot CI) was 95 %. Specifically, the influence of folk cultural distance on tourist satisfaction is significant ($\beta=0.152, P=0.015$). The confidence interval of mediating effect does not include 0, a and b are significant, and c' is not significant, indicating that it has a mediating effect on tourist satisfaction through emotional attachment, showing a complete mediating effect. Producing cultural distance has a significant impact on tourist satisfaction ($\beta=0.447, P=0.000$), and the confidence interval of the mediating effect does not include 0, indicating that it exists through the mediating effect of emotional attachment on satisfaction, showing a

partial mediating effect. The shared cultural distance has a significant impact on tourist satisfaction ($\beta=0.246, P=0.000$). The confidence interval of the mediating effect does not include 0, indicating that it exists through the mediating effect of emotional attachment on tourist satisfaction. The confidence interval does not include 0, showing a complete mediating effect. However, the impact of life cultural distance on tourist satisfaction is less significant ($\beta=0.097, P=0.151$), and the confidence interval of its mediating effect includes 0, and the mediating effect of emotional attachment on tourist satisfaction is not significant. The reason may be that tourists' stay in Dunhuang is not very long. The main activities are mainly near scenic spots such as Mogao Grottoes, Mingsha Mountain Crescent Spring Scenic Spot, Yangguan tourist attractions and Shazhou Night Market. They do not have an in-depth experience of the lives of their local residents. The impact of life cultural distance on satisfaction is not significant.

Table 5 Results of Mediating Effect Analysis

project	tourist satisfaction					emotional attachment					tourist satisfaction				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.126**	0.023	5.419	0.000	-	0.110**	0.026	4.164	0.000	-	0.075**	0.020	3.671	0.000	-
life cultural distance	0.093	0.064	1.440	0.151	0.097	0.128	0.073	1.748	0.082	0.127	0.033	0.055	0.603	0.547	0.035
folk cultural distance	0.134*	0.055	2.450	0.015	0.152	0.151*	0.062	2.429	0.016	0.163	0.064	0.047	1.356	0.176	0.072
production cultural distance	0.402**	0.047	8.560	0.000	0.447	0.285**	0.053	5.345	0.000	0.301	0.269**	0.042	6.425	0.000	0.299
shared cultural distance	0.219**	0.048	4.544	0.000	0.246	0.304**	0.055	5.557	0.000	0.325	0.077	0.043	1.79	0.075	0.087
emotional attachment											0.466**	0.045	10.459	0.000	0.490
R2			0.742					0.698					0.814		
adjust R2			0.738					0.694					0.811		
F value			F (4,282)=202.338,p=0.000					F (4,282)=162.914,p=0.000					F (5,281)=245.968,p=0.000		

* p<0.05 ** p<0.01

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c'direct effect	inspection conclusion
life cultural distance=>emotional attachment=>tourist satisfaction	0.093	0.128	0.466**	0.060	0.039	1.542	0.123	-0.017 ~ 0.137	0.033	mediating effect is not significant
folk cultural distance=>emotional attachment=>tourist satisfaction	0.134*	0.151*	0.466**	0.070	0.041	1.721	0.085	0.004 ~ 0.165	0.064	full mediation
production cultural distance=>emotional attachment=>tourist satisfaction	0.402*	0.285**	0.466**	0.133	0.045	2.930	0.003	0.070 ~ 0.252	0.269**	partial mediation
shared cultural distance=>emotional attachment=>tourist satisfaction	0.219*	0.304**	0.466**	0.142	0.047	2.997	0.003	0.082 ~ 0.269	0.077	full mediation

Remark: * p<0.05 ** p<0.01,bootstrap type = bias correction bootstrap method

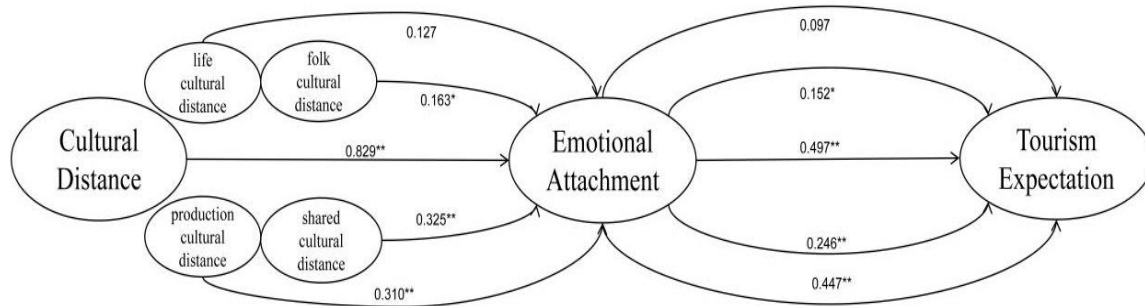


Fig 4 Tourism Expectation Intermediary Structure Model Diagram
(Figure 4 is placed after Table 5)

4.3.2 An analysis of the mediating effect of tourism expectation

(1) The total mediating effect of tourism expectation in cultural distance and emotional attachment

According to the results of Table 6, it can be seen that cultural distance has a significant positive impact on emotional attachment ($\beta=0.829, p=0.000$), indicating that the total effect is established. Cultural distance has a significant positive impact on tourism expectation ($\beta=0.817, p=0.000$). Cultural distance

has a significant positive impact on emotional attachment ($\beta=0.373, p=0.000$), and tourism expectation also has a significant positive impact on emotional attachment ($\beta=0.559, p=0.000$). Therefore, it shows that the intermediary role of tourism expectation in the model is established. At the same time, the mediating effect interval of tourism expectation does not contain 0, and a, b, c and c' are significant, $a * b$ and c' are both positive, indicating that tourism expectation has a partial mediating effect.

Table 6 Results of Mediating Effect Analysis

	emotional attachment					tourism expectation					emotional attachment				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.109**	0.026	4.135	0.000	-	0.119**	0.027	4.342	0.000	-	0.043	0.022	1.926	0.055	-
cultural distance	0.868**	0.035	25.061	0.000	0.829	0.856**	0.036	23.885	0.000	0.817	0.390**	0.049	7.949	0.000	0.373
tourism expectation											0.558**	0.047	11.932	0.000	0.559
R2			0.688					0.667					0.792		
adjust R2			0.687					0.666					0.791		
F value			F (1,285)=628.066,p=0.000					F (1,285)=570.506,p=0.000					F (2,284)=540.989,p=0.000		

* p<0.05 ** p<0.01

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c'direct effect	inspection conclusion
cultural distance=>tourism expectation=>emotional attachment	0.868**	0.856**	0.558**	0.478	0.051	9.423	0.000	0.351 ~ 0.552	0.390**	partial mediation

Remark: * p<0.05 ** p<0.01,bootstrap type = bias correction bootstrap method

(2)The mediating effect of tourism expectation in each part of cultural distance and emotional attachment

The Bootstrap method was used for analysis, and the number of repeated sampling was set to 5000 times, and the confidence interval (Boot CI) was 95 %. As shown in table 7, in the path of life culture distance to tourism expectation to emotional attachment, the confidence interval of mediating effect does not include 0, a and b significant, c ' not significant, showing a complete mediating effect, indicating that life culture distance exists through the mediating effect of tourism expectation on emotional attachment. In the path of production cultural distance to tourism expectation to emotional attachment, the confidence interval of mediating effect does not include 0, the total effect c is significant, a and b are significant, the direct effect c ' is significant, and a * b and c ' are both positive, which has a partial mediating effect, indicating that the mediating effect of production cultural distance on emotional attachment through tourism expectation exists. In the path of shared cultural distance to tourism expectation to emotional attachment, the

confidence interval of mediating effect does not include 0, a, b, c and c ' are significant, and a * b and c ' are both positive, with partial mediating effect, indicating that shared cultural distance exists through the mediating effect of tourism expectation on emotional attachment. However, in the path from folk culture distance to tourism expectation to emotional attachment, the confidence interval of mediating effect includes 0, and the mediating effect is not significant, indicating that the mediating effect of folk culture distance on emotional attachment through tourism expectation is not obvious. Specifically, the distance of folk culture to the expected path of tourism is not significant ($\beta=0.069, p=0.317$). The possible reason is that tourists have less experience of Dunhuang folk culture, more cultural experience and natural landscape appreciation in scenic spots such as Mogao Grottoes and :Mingsha Mountain Crescent Spring Scenic Spot, while folk culture is used as a subsidiary experience after the experience of scenic spots. Therefore, in the process of tourism, there will be no great expectation for the distance of folk culture.

Table 7 Results of Mediating Effect Analysis

	emotional attachment					tourism expectation					emotional attachment				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.110**	0.026	4.164	0.000	-	0.119**	0.027	4.375	0.000	-	0.045*	0.023	1.981	0.049	-
life cultural distance	0.128	0.073	1.748	0.082	0.127	0.203**	0.075	2.695	0.007	0.202	0.016	0.061	0.269	0.788	0.016
folk cultural distance	0.151*	0.062	2.429	0.016	0.163	0.064	0.064	1.002	0.317	0.069	0.116*	0.051	2.250	0.025	0.125
production cultural distance	0.285**	0.053	5.345	0.000	0.301	0.259**	0.055	4.707	0.000	0.273	0.143**	0.046	3.128	0.002	0.151
shared cultural distance	0.304**	0.055	5.557	0.000	0.325	0.335**	0.056	5.934	0.000	0.357	0.121*	0.048	2.514	0.012	0.129
tourism expectation											0.549**	0.048	11.481	0.000	0.550
R2			0.698					0.681					0.794		
adjust R2			0.694					0.676					0.791		
F value			F (4,282)=162.914,p=0.000					F (4,282)=150.314,p=0.000					F (5,281)=217.155,p=0.000		

* p<0.05 ** p<0.01

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c'direct effect	inspection conclusion
life cultural distance										
=>tourism expectation=>emotional attachment	0.128	0.203**	0.549**	0.111	0.046	2.408	0.016	0.011 ~ 0.199	0.016	full mediation
folk cultural distance										
=>tourism expectation=>emotional attachment	0.151*	0.064	0.549**	0.035	0.048	0.729	0.466	-0.060 ~ 0.131	0.116*	mediating effect is not significant
production cultural distance										
=>tourism expectation=>emotional attachment	0.285**	0.259**	0.549**	0.142	0.046	3.092	0.002	0.066 ~ 0.248	0.143**	partial mediation
shared cultural distance										
=>tourism expectation=>emotional attachment	0.304**	0.335**	0.549**	0.184	0.050	3.640	0.000	0.108 ~ 0.308	0.121*	partial mediation

Remark: * p<0.05 ** p<0.01,bootstrap type = bias correction bootstrap method

According to the test results of table 8, we can see that, first of all, emotional attachment has a significant positive impact on tourist satisfaction ($\beta=0.864$, $p=0.000$), indicating that the total effect is established. Secondly, emotional attachment has a significant positive impact on tourism expectations ($\beta=0.864$, $p=0.000$). Finally, emotional attachment has a significant positive impact on touristsatisfaction ($\beta=0.677$, $p=0.000$), while tourism expectation also

has a significant positive impact on tourist satisfaction ($\beta=0.216$, $p=0.000$). Therefore, it shows that the intermediary role of tourism expectation in the model is established. At the same time, the mediating effect interval of tourism expectation does not contain 0, and a, b, c and c' are significant, a * b and c' are both positive, indicating that tourism expectation has a partial mediating effect.

Table 8 Results of Mediating Effect Analysis

	tourist satisfaction					tourism expectation					tourist satisfaction				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.129**	0.022	5.844	0.000	-	0.102*	0.023	4.389	0.000	-	0.108**	0.022	4.843	0.000	-
emotional attachment	0.822**	0.028	28.954	0.000	0.864	0.865*	0.030	28.919	0.000	0.864	0.644**	0.055	11.698	0.000	0.677
tourism expectation											0.205**	0.055	3.736	0.000	0.216
R 2		0.746					0.746					0.758			
adjust R2		0.745					0.745					0.756			
F value	F (1,285)=838.326,p=0.000					F (1,285)=836.335,p=0.000					F (2,284)=445.202,p=0.000				

* $p<0.05$ ** $p<0.01$

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c'direct effect	inspection conclusion
emotional attachment => tourism expectation => tourist satisfaction	0.822*	0.865**	0.205**	0.178	0.084	2.110	0.035	0.009 ~ 0.342	0.644*	部分中介

Remark: * $p<0.05$ ** $p<0.01$,bootstrap type = bias correction bootstrap method

According to the test results of table 9, we can see that, first of all, cultural distance has a significant positive impact on tourist satisfaction($\beta=0.855$, $p=0.000$), indicating that the total effect is established. Secondly, cultural distance has a significant positive impact on tourism expectation ($\beta=0.817$, $p=0.000$). Cultural distance has a significant positive impact on satisfaction ($\beta=0.602$, $p=0.000$), and tourism expectation also has a

significant positive impact on satisfaction ($\beta=0.309$, $p=0.000$). Therefore, it shows that the intermediary role of tourism expectation in the model is established. At the same time, the mediating effect interval of tourism expectation does not contain 0, and a, b, c and c' are significant, a * b and c' are both positive, indicating that tourism expectation has a partial mediating effect.

Table 9 Results of Mediating Effect Analysis

	tourist satisfaction					tourism expectation					tourist satisfaction				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.117**	0.023	5.006	0.000	-	0.119**	0.027	4.342	0.000	-	0.082**	0.023	3.616	0.000	-
cultural distance	0.851**	0.031	27.796	0.000	0.855	0.856**	0.036	23.885	0.000	0.817	0.600**	0.050	12.014	0.000	0.602
tourism expectation											0.294**	0.048	6.173	0.000	0.309
R 2		0.731					0.667					0.762			
adjust R2		0.730					0.666					0.761			
F value	F (1,285)=772.602,p=0.000					F (1,285)=570.506,p=0.000					F (2,284)=455.656,p=0.000				

* p<0.05 ** p<0.01

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c' direct effect	inspection conclusion
cultural distance => tourism expectation => tourist satisfaction	0.851**	0.856**	0.294**	0.252	0.057	4.429	0.000	0.138 ~ 0.359	0.600**	partial mediation

Remark: * p<0.05 ** p<0.01,bootstrap type = bias correction bootstrap method

Table 10 Results of Mediating Effect Analysis

	tourist satisfaction					tourism expectation					tourist satisfaction				
	B	standard deviation	t	p	β	B	standard deviation	t	p	β	B	standard deviation	t	p	β
constant	0.126**	0.023	5.419	0.000	-	0.119**	0.027	4.375	0.000	-	0.092**	0.023	4.055	0.000	-
life cultural distance	0.093	0.064	1.440	0.151	0.097	0.203**	0.075	2.695	0.007	0.202	0.035	0.062	0.564	0.573	0.036
folk cultural distance	0.134*	0.055	2.450	0.015	0.152	0.064	0.064	1.002	0.317	0.069	0.116*	0.052	2.236	0.026	0.131
production cultural distance	0.402**	0.047	8.560	0.000	0.447	0.259**	0.055	4.707	0.000	0.273	0.328**	0.046	7.125	0.000	0.364
shared cultural distance	0.219**	0.048	4.544	0.000	0.246	0.335**	0.056	5.934	0.000	0.357	0.123*	0.048	2.556	0.011	0.139
tourism expectation											0.286**	0.048	5.947	0.000	0.301
R 2		0.742					0.681					0.770			
adjust R2		0.738					0.676					0.766			
F value	F (4,282)=202.338,p=0.000					F (4,282)=150.314,p=0.000					F (5,281)=188.674,p=0.000				

* p<0.05 ** p<0.01

Summary of mediating effect test results

project	c gross effect	a	b	a*b Mediation effect value	a*b (Boot SE)	a*b (z value)	a*b (p value)	a*b (95% Boot CI)	c' 直接效应	检验结论
life cultural distance =>tourism expectation=>emotional satisfaction	0.093	0.203**	0.286**	0.058	0.026	2.260	0.024	0.009 ~ 0.112	0.035	full mediation
folk cultural distance =>tourism expectation=>emotional satisfaction	0.134*	0.064	0.286**	0.018	0.026	0.694	0.488	-0.035 ~ 0.071	0.116*	The mediating effect is not significant.
production cultural distance =>tourism expectation=>emotional satisfaction	0.402**	0.259**	0.286**	0.074	0.032	2.282	0.022	0.031 ~ 0.161	0.328**	partial mediation
shared cultural distance =>tourism expectation=>emotional satisfaction	0.219**	0.335**	0.286**	0.096	0.036	2.672	0.008	0.051 ~ 0.193	0.123*	partial mediation

Remark: * p<0.05 ** p<0.01,bootstrap type = bias correction bootstrap method

(Table 10 is placed behind Table 9)

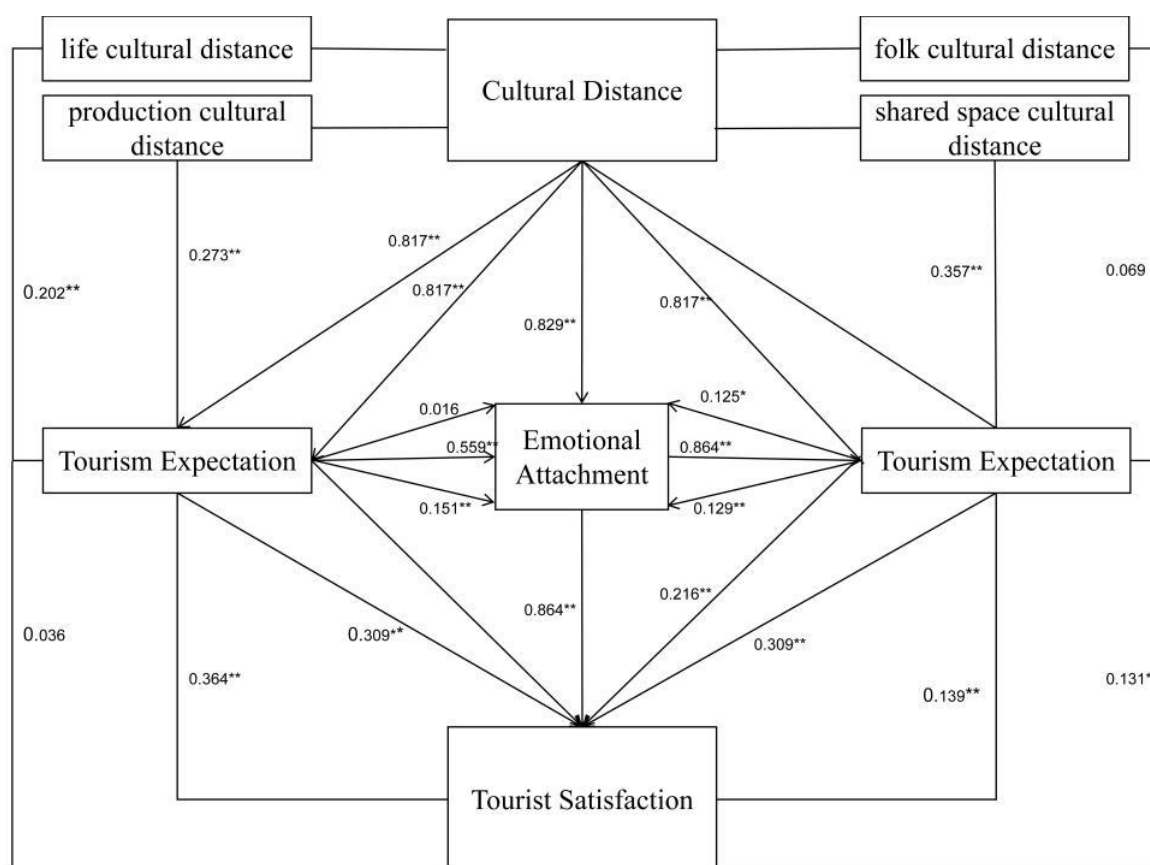


Fig.5 Tourism Expectation Intermediary Structure Model
(Table 5 is placed after table 10)

4.3.3 Regional heterogeneity analysis

Tourists from different regions have different perceptions and emotions about Dunhuang. The article takes the tourist residence as the grouping basis, 0 represents Gansu, 1 represents the provinces near Gansu (Shaanxi, Inner Mongolia, Qinghai, Sichuan, Ningxia), and 2 represents other provinces. Through group regression analysis, the influence of cultural distance and emotional attachment on tourist satisfaction in different regions and provinces is further studied.

(1) Cultural distance to tourist satisfaction

Through the analysis of table 11 data, it is found that the impact of cultural distance on tourist satisfaction is significantly different due to the different sources of tourists : local tourists in Gansu are the most affected coefficient 0.933***), followed by remote tourists such as Beijing and Shanghai (0.876***), while tourists from surrounding provinces (such as Shaanxi and Ningxia) are the least affected (0.533***). The reason may be that the

surrounding provinces (Ningxia, Qinghai) are similar to the culture of Dunhuang tourist destinations, and the differences are not particularly prominent. The similarity of language customs and religious traditions is high, which leads to tourists ' weak perception of cultural differences, and the effect of cultural distance is weakened. Secondly, local tourists have a deep understanding of cultural symbols such as Mogao Grottoes because of their long-term exposure to Dunhuang culture. Moderate cultural differences can stimulate their cultural pride and form a special effect of ' more familiar and more sensitive '. Due to the great differences in living environment among tourists in other provinces, the novelty of Dunhuang culture can better meet their exploration needs, so the cultural distance has a strong promoting effect. The difference test shows that the difference between Gansu and surrounding provinces is extremely significant ($p < 0.001$), and the difference between surrounding and other provinces is also significant ($p < 0.001$).

Table 11 Grouped Regression Model Results

	entirety	0Gansu	1vicinity	2other
constant	0.117*** (5.006)	0.038 (1.252)	0.364*** (4.221)	0.107*** (3.551)
cultural distance	0.851*** (27.796)	0.933*** (22.636)	0.533*** (4.774)	0.876*** (22.331)
sample size	287	86	44	157
R2	0.731	0.859	0.352	0.763
adjust R2	0.730	0.857	0.336	0.761
F value	F(1,285)=772.602,p=0.000	F(1,84)=512.394,p=0.000	F(1,42)=22.794,p=0.000	F(1,155)=498.676,p=0.000

*p<0.1 **p<0.05 ***p<0.01

Difference test of regression coefficient

Name	item1	item2	b1	b2	difference	t	p
	0	1	0.933	0.533	0.400	4.064	0.000***
Cultural distance	0	2	0.933	0.876	0.057	0.952	0.342
	1	2	0.533	0.876	-0.343	-3.595	0.000***

* p<0.1 ** p<0.05 *** p<0.01

(2) Cultural attachment to tourist satisfaction

As shown in Table 12, through group regression analysis, it is revealed that there are significant regional differences in the mechanism of emotional attachment on tourist satisfaction. The data shows that the emotional attachment effect of local tourists in Gansu is the strongest ($\beta=0.925^{***}$), which may be due to the deep adjustment of emotional transformation efficiency by cultural identity, which can effectively improve satisfaction through cultural pride. Other provinces are second ($\beta=0.797^{***}$), and the surrounding provinces are the weakest ($\beta=0.679^{***}$). Tourists in surrounding provinces (Shaanxi/ Ningxia, etc.) are affected by geographical

proximity and choose short-term sightseeing. Emotional attachment is difficult to be fully transformed into satisfaction due to shallow contact. Through the test of regression coefficient difference, the system verifies that the effect of emotional attachment on tourist satisfaction has significant regional heterogeneity. Specifically : there is a significant difference between Gansu and its surrounding provinces ($p=0.011$); there were significant differences between Gansu and other provinces ($p=0.043$) ; there was no significant difference between the surrounding and other provinces ($p=0.181$).

Table 12 Grouped Regression Model Results

	entirety	0	1	2
constant	0.129*** (5.844)	0.045 (1.198)	0.245*** (3.533)	0.152*** (5.207)
emotional attachment	0.822*** (28.954)	0.925*** (18.521)	0.679*** (7.702)	0.797*** (21.668)
sample size	287	86	44	157
R2	0.746	0.803	0.585	0.752
adjust R2	0.745	0.801	0.576	0.75
F value	F (1,285)=838.326,p=0.000	F (1,84)=343.017,p=0.000	F (1,42)=59.313,p=0.000	F (1,155)=469.497,p=0.000

* p<0.1 ** p<0.05 *** p<0.01

Difference test of regression coefficient							
Name	item1	item2	b1	b2	difference	t	p
emotional attachment	0	1	0.925	0.679	0.246	2.588	0.011**
	0	2	0.925	0.797	0.128	2.034	0.043**
	1	2	0.679	0.797	-0.118	-1.341	0.181

* p<0.1 ** p<0.05 *** p<0.01

(3) Tourism expectation to tourist satisfaction

Based on the results of the group regression model based on table 13, there are significant differences in the transformation mechanism of tourism expectation to satisfaction among tourists from Gansu local (group 0), surrounding areas (group 1) and other areas (group 2). The coefficient difference between Gansu and the surrounding areas is 0.339 ($p=0.003^{***}$), and the difference between other regions and the surrounding areas is -0.340 ($p=0.000^{***}$), which verifies the heterogeneity of inter-regional mechanisms. The tourism expectation coefficient of local tourists in Gansu is 0.816**** ($p<0.01$), and the adjusted R2 is 0.644, which is strong and stable. The regional coefficient of the surrounding provinces plummeted to 0.477*** ($p<0.01$), and the adjusted R2 was only 0.362, indicating that the positive effect of expectation on satisfaction was significantly

weakened, and the model prediction ability was insufficient. The main reason is the lack of sample size. The regional coefficient of other provinces is 0.817*** ($p<0.01$), and the adjusted R2 is as high as 0.724, becoming the group with the closest relationship between tourism expectation and satisfaction in the three groups. From the perspective of supply and demand, Gansu local tourists are dominated by short-distance leisure needs, paying more attention to convenience rather than service details, making the gap between expectations and experiences smaller. Surrounding tourists are more sensitive to instant service, while tourists in other provinces pay more attention to macro experience: even if there is a problem of "mechanization of tour guide explanation," they still give high satisfaction due to cultural shock.

Table 13 Grouped Regression Model Results

	entirety	0	1	2			
constant	0.174*** (6.653)	0.118** (2.397)	0.411*** (5.648)	0.133*** (4.130)			
tourist expectation	0.761*** (22.590)	0.816*** (12.438)	0.477*** (5.044)	0.817*** (20.274)			
sample size	287	86	44	157			
R2	0.642	0.648	0.377	0.726			
adjust R2	0.64	0.644	0.362	0.724			
F value	F(1,285)=510.301,p=0.000	F(1,84)=154.710,p=0.000	F(1,42)=25.446,p=0.000	F(1,155)=411.045,p=0.000			
*p<0.1**p<0.05***p<0.01							
Difference test of regression coefficient							
Name	item1	item2	b1	b2	difference	t	p
tourism expectation	0	1	0.816	0.477	0.339	3.031	0.003***
	0	2	0.816	0.817	-0.001	-0.02	0.984
	1	2	0.477	0.817	-0.34	-3.871	0.000***
*p<0.1**p<0.05***p<0.01							

5. Conclusion

5.1 The mediating role of emotional attachment

Through the analysis of the mediating role of emotional attachment in cultural distance to tourist satisfaction, the following two conclusions can be drawn:

First, cultural distance has a significant positive impact on tourist satisfaction ($p=0.000$), and H1 tourists' perceived cultural distance has a positive impact on satisfaction. The influence of folk culture distance on tourist satisfaction is significant ($P=0.015$), and the positive influence of H1 b tourists' perception of folk culture distance on satisfaction is established. The production cultural distance has a significant impact on tourist satisfaction ($P=0.000$), and H1 c tourists' perception of production cultural distance has a positive impact on satisfaction. Spatial cultural distance has a significant impact on tourist satisfaction ($P=0.000$), and H1 d tourists' perception of shared space cultural distance has a positive impact on satisfaction. However, the impact of life cultural distance on tourist satisfaction ($P=0.151$) is low, and the positive impact of H1 a tourists' perception of life cultural distance on satisfaction is not established.

Second, emotional attachment plays an intermediary role in the influence of tourists' perceived cultural distance on tourists' satisfaction. H2 was established. And the mediating effect of each sub-variable is analyzed. The distance of folk culture, the distance of production culture and the distance of shared culture all pass the mediating test, and H2b, H2c and H2d are established. Because H1a does not exist, so H2a does not exist.

Therefore, tourists' perceived cultural distance has a significant positive impact on tourists' satisfaction, and emotional attachment plays an

intermediary role between them.

5.2 The mediating role of tourism expectation

Through the analysis of the mediating effect of tourism expectation on cultural distance to emotional attachment, the following three conclusions can be drawn:

First, the mediating effect interval of tourism expectation does not contain 0, and a, b, c and c' are significant, a * b and c' are both positive, indicating that tourism expectation plays a partial mediating role between tourists' perceived cultural distance and emotional attachment, H3 is established. In the path of life culture distance to tourism expectation to emotional attachment, the confidence interval of mediating effect does not include 0, a and b significant, c' not significant, showing a complete mediating effect, H3 a is established. In the path of production cultural distance and shared cultural distance to tourism expectation to emotional attachment, the confidence interval of mediating effect does not include 0, the total effect c is significant, a and b are significant, and the direct effect c' is significant, and a * b and c' are both positive, with partial mediating effect, H3c and H3d are established. In the path from folk culture distance to tourism expectation to emotional attachment, the confidence interval of mediating effect includes 0, the mediating effect is not significant, and H3 b is not established.

Second, tourism expectation plays an intermediary role between tourists' place emotional attachment and tourists' satisfaction. The mediating effect interval does not contain 0, and a, b, c and c' are significant, a * b and c' are both positive, indicating that tourism expectation has a partial mediating effect, and H4 is established.

Third, tourism expectation plays an

intermediary role between tourists' perceived cultural distance and tourists' satisfaction. In the path analysis of tourists' perceived cultural distance to tourists' satisfaction, the intermediary effect interval of tourism expectation does not contain 0, and a, b, c and c' are significant, a * b and c' are both positive, with partial intermediary role, H5 is established. In the path from life culture distance to tourism expectation to satisfaction, the confidence interval of mediating effect does not include 0, showing a complete mediating effect, and H5a is established. In the path of production cultural distance and shared cultural distance to tourism expectation to satisfaction, the confidence interval of mediating effect does not include 0, the total effect c is significant, a and b are significant, the direct effect c' is significant, and a * b and c' are both positive, with partial mediating effect, H5c and H5d are established. In the path from folk culture distance to tourism expectation to satisfaction, the confidence interval of mediating effect includes 0, and the mediating effect is not significant, indicating that the mediating effect of folk culture distance on satisfaction through tourism expectation is not obvious, and H5b is not established.

Therefore, tourism expectation plays an intermediary role in the three paths of tourists' perception of cultural distance to emotional attachment, emotional attachment to tourist satisfaction and cultural distance to satisfaction.

5.3 Regional heterogeneity analysis

By constructing a grouping regression model, the sample data is divided into three groups: Gansu, surrounding provinces and other regions, and the following conclusions are obtained:

First, there is significant regional heterogeneity in the effect of cultural distance on tourist satisfaction. The effect of cultural distance on tourist satisfaction shows a 'cultural homology weakening effect', that is, Gansu ($\beta=0.933^{***}$) > other provinces (0.876^{***}) > surrounding provinces (0.533^{***}). The difference test shows that the difference between Gansu and surrounding provinces is extremely significant ($p<0.001$), and the difference between surrounding and other provinces is also significant ($p<0.001$).

Second, there are significant regional differences in the mechanism of emotional attachment on tourist satisfaction. Specifically: there are significant differences between Gansu local and surrounding provinces and other provinces. The intensity of emotional attachment was Gansu ($\beta=0.925^{***}$) > other provinces (0.797^{***}) > surrounding (0.679^{***}).

Third, there are significant regional differences in the transformation mechanism of tourism expectation to satisfaction. The coefficient difference between Gansu and the surrounding areas is 0.339

($p=0.003^{***}$), and the difference between other regions and the surrounding areas is -0.340 ($p=0.000^{***}$). The intensity of tourism expectation is other provinces (0.817^{***}) > Gansu ($\beta=0.816^{***}$) > surrounding areas (0.477^{***}).

It can be concluded that tourists from different regions have significant regional heterogeneity in the impact of perceived cultural distance and emotional attachment on tourist satisfaction, and there are also significant regional differences in the transformation of tourism expectations to satisfaction.

6. Discussion

This paper studies the influence of cultural distance, emotional attachment and tourism expectation of tourists in over-tourism destinations, mainly in Dunhuang, and draws the main conclusion that emotional attachment and tourism expectation play an intermediary role in the influence of tourists' perceived cultural distance on tourists' satisfaction. Tourism expectation plays an intermediary role between tourists' perceived cultural distance and emotional attachment. Tourism expectation plays an intermediary role between tourists' place emotional attachment and tourists' satisfaction. There is significant regional heterogeneity in the effect of tourists' perceived cultural distance on tourist satisfaction. There are significant regional differences in the effect of emotional attachment on tourist satisfaction. There are significant regional differences in the effect of tourism expectations on tourist satisfaction.

The contribution of the research is to enrich the research of cultural distance theory in tourism, especially the theory has been verified in excessive tourist destinations. The second is to put forward the mediating role of emotional attachment and tourist expectation in cultural distance on tourist satisfaction of excessive tourist destinations. The third is to provide a typical case study on the influence mechanism of cultural distance on tourist satisfaction. Fourthly, it puts forward the path research on the sustainable development of excessive tourism destinations based on the theory of tourism cultural distance, in order to provide reference for the sustainable development of tourism in the same type of regions of global and Dunhuang tourism destinations. However, the research is mainly based on the team's on-the-spot investigation data of Dunhuang. Constrained by the problem of questionnaire index design, it cannot cover all the measurement indicators, which has a certain impact on the insignificance of the results, and the sample gap in the heterogeneity analysis will also lead to the insignificance of the results. In the next step, the index coverage and sample representativeness can be improved by supplementing the design method of the measurement index and optimizing the sample

structure and expanding the sample size, so as to provide a more solid empirical basis for the follow-up research.

Declarations

Hybrid

I confirm that I understand journal Human Ecology is a hybrid journal. When research is accepted for publication, there is a choice to publish using either immediate gold open access or the traditional publishing route.

Competing Interests

No, I declare that the authors have no competing interests as defined by Springer, or other interests that might be perceived to influence the results and/or discussion reported in this paper.

Dual Publication

The results/data/figures in this manuscript have not been published elsewhere, nor are they under consideration (from you or one of your Contributing Authors) by another publisher.

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Data Availability

Yes, I have research data to declare.

"The datasets generated during and/or analyzed during the current study are not publicly available, but are available from the corresponding author on reasonable request."

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Conflict of Interest

The authors declare that there are no conflicts of interest to this work.

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