

ANALYSIS OF TOURIST BEHAVIOUR AND TOURISM IMAGE IN HAINAN PROVINCE

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Annotation. With the development of tourism, theoretical research on tourist behaviour and tourist destinations is becoming more and more important, but currently, for the specific micro-tourism in Hainan Province, Theoretical research on context is still lacking. Therefore, this study takes tourists to Hainan, where they have published relevant travel notes as research objects. It also uses Python and other technologies to analyse the crawled network. The travel notes were systematically studied, focusing on exploring the behavioral characteristics of tourists in Hainan Province through the three dimensions of “regional relevance of tourist flow, travel motivation, and stay time” and the three dimensions of “cognitive image, emotional image, and conative image”. The research conclusion is: (1) The regional correlation of tourist flows in Hainan Province focuses on Sanya City. The four major bays of Hainan radiate outward; (2) The primary travel motivation of tourists coming to Hainan is the outdoor project experience, followed by duty-free shopping; (3) Although tourists coming to Hainan show a discrete distribution in terms of stay time, the average performance is 5-6-day multi-day stay experience type; (4) Among the six cognitive image categories of “tourist core attractions, tourist accommodation, tourist transportation, tourist entertainment, tourist shopping, and tourist food”, tourists visiting Hainan Province have the perception of core tourism attractions such as “climate and natural scenery” in tourist destinations as the strongest, and the perception of tourism products is the lowest; (5) The perception of the emotional image of tourist destinations in Hainan Province is mostly positive-oriented. Relatively speaking, there are relatively few negative perceptions, which are mainly concentrated on the three aspects of “accommodation, transportation, and integrity”; (6) Hainan Province’s tourist destinations. Conative image perception is mainly reflected in tourists’ strong recommendation intention.

Keywords: tourist behaviour, tourist destination image perception, cognitive image, emotional image, conative image, Hainan Province.

JEL classification: L83, Z3, M30, M37, R11.

Introduction

Recently, Hainan Province has continued to promote the construction of an international tourist island background, opening up tourism consumption to the outside world (Leou, Li, 2022), and further steadily moving towards a global tourism consumption center, especially emphasising the “three returns” of

duty-free shopping, studying, and overseas medical treatment (Lin, 2022). Reality reflects good development prospects and new development trends. However, as a tourist destination, although Hainan Province has gained a good reputation, its actual tourism image has not yet formed a precise positioning that is aligned with the new trend of Hainan tourism development and has the characteristics of Hainan Island. Compared with Hawaii, Maldives and other types of island tourism lack strong market competitiveness (Ali et al., 2015). Further, academic research on tourism in Hainan Province mainly focuses on cruise tourism (Yang, 2018), ethnic cultural tourism (Shuying, 2017), and duty-free shopping (Bing, Mei, 2019); there are relatively few discussions on the overall tourism image of Hainan.

In Southern China, Hainan Province is a significant tourism destination, owing to its favourable weather and geographical location (Song et al., 2017). Hainan attracts over 1 million tourists annually, with more than 25\$ billion in exchanges (Song et al., 2017). Hence, tourism has become one of the most noticeable pillars that support the economic development of Hainan (Zhang et al., 2022). Hainan, as the largest island wholly situated in the tropical Chinese zone, has distinctive cultural customs, rich tourism resources, and a favourable atmosphere for tourism development (Xie, Wall, 2002). The spatial benefits and favourable policies have extended valuable opportunities for tourist development in the region (Zhang, Ju, 2021). In particular, the tourism industry of Hainan has realised rapid growth since the launch of the international tourism island strategy in 2009. In the same vein, the tourism revenue of Hainan accounted for nearly 19.9% of the region's GDP, which is significantly greater than the Chinese average (11%) and the global average level (6.6%) (Hainan Provincial Bureau of Statistics, 2020). Indeed, the duty-free policy is expected to support domestic tourism development considerably. Meanwhile, tourist destination image, elements, and how they are associated with behavioural intentions have been the subject of a wide range of studies (Azeez, 2021). Such studies primarily advocate that a sound destination image attracts first-time tourist, boosts their return probability, and makes them recommend the destination to others. Though the extant literature has scrutinised how different disciplines and industries have incorporated personality and image concepts in tourism settings (Kavoura, 2014), few studies have investigated how the overall image of a tourist destination shapes the behavioural intention of the tourists. The image of a tourist destination is closely linked to tourist behaviour (Yanju et al., 2019). As the main body of tourism, tourist behavioural characteristics are one of the most basic signs of tourists (Yang et al., 2019). Currently, there is a lack of in-depth analysis of the behavioural characteristics of tourists coming to Hainan. Therefore, there is an urgent need to create a behavioural portrait of tourists in Hainan Province's tourist destinations.

In light of the above analysis, this paper builds the overall image perception of Hainan as a tourist destination by systematically investigating the behavioural characteristics of tourists coming to Hainan Province. Data is obtained by crawling online travel notes on tourism platforms. Then, a text analysis is used to draw conclusions. In the specific micro-tourism situation of Hainan Province, this study offers a theoretical framework for tourist destination image, further enriching the proposed theory. Specifically, this research analyses new trends in tourism industry development, captures Hainan tourism in real time, shapes the behavioural characteristics of tourists coming to Hainan, and reflects the overall image perception of Hainan's tourist destinations. The consumption aspect of this study extends practical and theoretical references. Hence, this study not only offers novel insights for the sustainable development of product design and tourist destinations but also adds to the foreign tourism development in Hainan.

Using the theoretical framework proposed by Granter (1994), this study aims to explore the behavioural characteristics of tourists in Hainan Province to examine the perception of tourists' destination image in Hainan. To meet this aim, different objectives are set in this study which are as follows: on the one hand,

three distinct dimensions of regional relevance of tourist flow, travel motivation, and stay time are gauged to represent behavioral characteristics of tourists coming to Hainan province; while, on the other hand, three different dimensions of cognitive image, emotional image, and conative image are incorporated to capture the tourist's perception destination image.

1. Literature Review

In terms of tourist behaviour, this study supplements the concept of “regional correlation of tourist flow” by using some of the traditional tourist behaviour research dimensions to explore tourists in Hainan Province, a tourist destination, more comprehensively. Behavioural characteristics enrich the theoretical exploration of tourist behaviour in tourism situations (Xiang *et al.*, 2021). In terms of tourism image perception of Hainan Province, we use the Gartner tourism destination image perception theoretical framework to construct an overall tourism destination image belonging to Hainan Province. Perception. Ultimately, the theoretical framework of the research is as follows: revealing the tourist behaviour patterns of Hainan Province through “regional correlation of tourist flow, tourism motivation, and stay time”, and then through “cognitive image, emotional image, and conative image”, revealing the tourism image perception of Hainan Province.

1.1 Visitor Behaviour

Understanding tourists' behaviour in tourist destinations is an essential prerequisite for effectively promoting the development of the place (Kun *et al.*, 2020). The research on tourist behaviour has shown a multi-dimensional and multi-angle empirical approach, which mainly includes travel motivation, length of stay, revisit rate, tourist satisfaction, etc. (Xiaohua, Zhenfang, 2021; Xin, Hongzhi, 2012). These dimensions have become a consensus in research on tourist behaviour and can provide a research basis for describing the rules of tourist behaviour (Nguyen *et al.*, 2023).

Concurrently, research on tourists' spatial behaviour has also achieved rich results. During the early 1970s, foreign scholars emphasised “tourist spatial behaviour” (McKercher, Lew, 2004; Lew, McKercher, 2002; Gartner, 1994), laying a theoretical foundation for tourists' spatial behaviour. Domestic scholars have conducted diversified spatial behavior research on different regions and tourist groups, for instance, describing the spatiotemporal movement characteristics of tourist island tourists (Hui *et al.*, 2022), exploring the spatiotemporal behavioral characteristics of self-driving tourists (Yan-Ping, 2019), analysing the spatiotemporal distribution characteristics of tourists visiting Shanghai (Xiaoli, Lin, 2017), and studying the spatial flow rules of Shanghai urban tourists (Bihu, 1994). Correspondingly, scholars have begun emphasising the “regional correlation of tourist flow”. This concept explores areas where tourists frequently visit by studying the spatiotemporal behaviour trajectories of tourists, obtaining the location correlation perceived by different areas. The degree is the core dimension that reveals the tourist behaviour's rules (Luo *et al.*, 1993).

1.2 Tourists' Destination Image Perception

Gartner was the first to study destination image. He proposed that destination image is composed of three parts: “cognitive image, emotional image and conative image” (Junyi *et al.*, 2015). This theoretical framework was widely used in Kunming (Pengyang, Ting, 2019), Bali (Guisha *et al.*, 2019), Shaanxi (Qing *et al.*, 2018), Beijing (Ning *et al.*, 2018), and other research on the image perception of well-known domestic and foreign tourist destinations.

1.2.1 Cognitive Image

Cognitive image refers to an individual's knowledge and opinions about various attributes of a destination, which can reflect tourists' overall evaluation of the place (Bignalcaiz *et al.*, 2019). For instance, in Pi Rui's research on the tourism cognitive image of Shaolin Temple in Songshan Mountain, the research results show that tourists have a strong perception of "tourism attractions" and have the lowest perception of tourist shopping products, food, and accommodation facilities (Pi, Zheng, 2017). In their research on Hainan Province, some scholars found that tourists have a strong cognitive image perception of tourist attractions, natural scenery, and cleanliness (Zibin *et al.*, 2006). In addition, the cognitive image can also be discussed from different dimensions, mainly divided according to the "consumption composition" of tourists, that is, the six major consumption elements of "food, accommodation, transportation, travel, shopping, and entertainment" (Yang *et al.*, 2021; Jing, 2020; Kun *et al.*, 2020). Based on the above, six classification dimensions, tourists' cognitive image differences and preferences can be deeply analysed.

1.2.2 Emotional Image

Tourists' destination emotional image refers to evaluations or emotions (Hallmann, 2015), such as excitement, happiness, discomfort and others. Foreign research involving tourists' emotions emphasises acceptance of destination recommendations (Notaro *et al.*, 2019), customer value creation and resource consumption (Hosany *et al.*, 2017), and emotional motivation (Malone *et al.*, 2018). Domestic scholars' research on emotional images uses text analysis to obtain the emotional degree of cognitive images around the two dimensions of positive and negative emotions (Fengjiao *et al.*, 2023), to judge tourists' emotional images of tourist destinations. For instance, by analysing the emotions of mainland tourists in Taiwan, scholars have found that "nostalgia, envy, shock, and unforgettable" are the emotional images of mainland tourists towards Taiwan (Tian, Shu, 2014), as well as their emotions towards online texts. Reportedly, the proportion of positive and negative emotions in travel notes about visiting Hainan was 85.57% and 12.44%, respectively (Zhu, Xing, 2020). Through this polarisation trend analysis of the destination's emotional image, it is helpful to find out the specific factors that cause tourists to have negative perceptions of the destination (Lina, Hua, 2019) to make targeted improvements and further improve the experiences.

1.2.3 Conative Image

The conative image represents that tourists regard a particular place as a priority destination and can express tourists' expectations for the destination (White, 2014; Dann, 1996). By analysing conative behaviours such as word-of-mouth recommendations of a particular tourist destination, it is possible to confirm the degree of tourists' perception of the conative image of the tourist destination. These studies often use the word frequency analysis to obtain tourists' conative image perception from "conative keywords", the most common of which is "recommendation". However, the vocabulary related to conation is not single, and only using "recommendation" as a keyword in text analysis cannot fully summarise the actual conation image of tourists (Lin *et al.*, 2020). Zhou Yongbo used "this tourist destination is very worth visiting" as an indicator setting of the conative image scale structure of tourist destinations (Yongbo, 2020). Therefore, based on the vocabulary of "recommendation", this study also adds the word "worthy" as the key to the analysis of the conative image and has certain theoretical explorations to improve the keywords of the conative image.

2. Research Design

2.1 Research Plan

For tourist behaviour and tourist destination image perception, text data analysis such as online travel notes (Hong-ri *et al.*, 2014) and tourist travel records (Fenghua *et al.*, 2015) is an effective method. This study uses network text analysis. The theoretical research framework has been initially ascertained. The specific research plan is as follows:

In terms of tourist behaviour in Hainan Province, the literature review summarised that traditional tourist behaviour analysis is mainly carried out from the aspects of “travel motivation, length of stay, revisit rate, tourist satisfaction”, but this study selected two dimensions: “travel motivation and length of stay”. The reason is the following: first of all, for “tourist satisfaction”, the quantitative research method of The Likert Scale is usually used to measure satisfaction (Minhui *et al.*, 2023), and the concept of “satisfaction” belongs to the emotional category (Fucheng *et al.*, 2017), and this study can be analysed through “emotional image”. Tourists’ positive and negative emotional values can be obtained to explore the emotions of tourists coming to Hainan more comprehensively. Secondly, this article adopts the text analysis method of online travel notes. It is difficult to distinguish whether a tourist is a “re-visit” from the content of the travel notes, so the repeat-visit rate cannot be objectively obtained. In summary, based on the two traditional dimensions of tourist behaviour research – travel motivation and length of stay – this study introduces the concept of “regional correlation of tourist flow”. By integrating all three dimensions – regional correlation of tourist flow, travel motivation, and length of stay – it provides a comprehensive understanding of tourist behaviour patterns in Hainan Province.

Hainan Province’s tourism image perception is revealed through “cognitive image, emotional image, and conative image”. The first is a cognitive image. Referring to existing research, we constructed “tourism” around the six dimensions of “food, accommodation, transportation, travel, shopping, and entertainment”, most closely related to tourist consumption categories. The six major categories of tourists’ cognitive image are “attractions, tourist accommodation, tourist transportation, tourist entertainment, tourist shopping, and tourist food”. Then, the cognitive tendency of tourists is measured through cognitive quantity indicators. The second is the emotional image, by establishing five indicators: the total emotional value of the travel text, the cognitive amount of positive emotional keywords in the text and their corresponding positive emotional values, the cognitive amount of negative emotional keywords, and their corresponding negative emotional values. To comprehensively measure tourists’ emotional tendencies. Finally, there is the conative image. Through statistical analysis of keywords such as “recommended” and “worthwhile” in the text data, the conative tendency of tourists can be obtained.

2.2 Data Acquisition, Data Preprocessing and Analysis Methods

First, Octopus software is used to collect travel notes and text data about Hainan Province on three websites: Mafengwo, Ctrip, and Qunar. The time span was from June 2020 to June 2022. A total of 2,249 travel notes were collected. Secondly, the Pandas library in the Python program was used for data preprocessing. The specific steps include (1) combining all texts into a Dataframe data table; (2) deleting duplicates, single nodes, and marketing categories ‘Travel notes’; (3) using statistical functions to filter Chinese text with a length of less than 100 characters; (4) removing travel notes that do not belong to Hainan Province. After screening, 2148 travel notes were used in this article. Finally, text analysis of “word segmentation processing, word frequency statistics, and sentiment analysis” is completed through Python. Among them, “word segmentation processing” uses Python’s Jieba third-party Chinese word segmentation library for text segmentation, deletes meaningless words in the word segmentation

results through code, uses a dictionary to count word frequencies, and uses Pandas's Dataframe format to save word frequency statistics as CSV file and then output the top 60 feature words ranked by word frequency, as shown in *Table 1*.

Table 1. The Top 60 Feature Words in the Sample Text with the Highest Word Frequency

sort	high-frequency words	Frequency	sort	high-frequency words	Frequency	sort	high-frequency words	Frequency	sort	high-frequency words	Frequency
1	Sanya	2,3448	16	Airport	3,942	31	Room	2,907	46	feature	2,347
2	hotel	2,0407	17	good	3,928	32	gourmet food	2,724	47	Check-in	2,346
3	Hainan	1,2862	18	Suitable	3,907	33	journey	2,669	48	Waning	2,317
4	seafood	7,438	19	Attractions	3,831	34	tropical	2,650	49	Wenchang	2,199
5	Haikou	6,381	20	Sanya bay	3,785	35	tasty	2,637	50	Play	2,188
6	Yalong Bay	6,346	21	experience	3,667	36	project	2,509	51	Serve	2,187
7	beach	6,288	22	special	3,514	37	Check-in	2,490	52	Dadonghai	2,047
8	coconut	6,275	23	recommend	3,418	38	seawater	2,476	53	Lingshui	2,000
9	like	4,588	24	beach	3,413	39	child	2,440	54	City	1,979
10	seaside	4,551	25	tourists	3,384	40	Tickets	2,432	55	coconut grove	1,910
11	vacation	4,490	26	smell	3,363	41	Homestay	2,413	56	Coconut Dream Corridor	1,905
12	Haitang Bay	4,407	27	travel	3,302	42	market	2,384	57	Landscape	1,903
13	Dining room	4,171	28	sea	3,260	43	Wuzhizhou Island	2,380	58	Photo	1,901
14	Photograph	4,118	29	swimming pool	3,027	44	surf	2,378	59	Garden	1,893
15	Scenic spots	4,067	30	price	2,986	45	car rental	2,347	60	Weather	1,889

Source: own calculations.

Regarding the sentiment analysis method, the sentiment analysis in this study will use the Senta_BILSTM text analysis model in the PaddlePaddle neural network framework for in-depth exploration. The PaddlePaddle neural network framework is a general framework for deep learning and has broad applicability.

3. Results and Analysis

3.1 Analysis of Tourist Behaviour Patterns

3.1.1 Regional Correlation Analysis of Tourist Flow

The regional correlation analysis of tourist flow is based on graph-les-miserables in Echarts to build the spatial structure connection between regions, and then it is docked with Python. The specific operation first saves the text route in TXT, divides the route, and finally calculates the weight of the route. The method of calculating the weight is: first, use Scipy's `coo_matrix` module in Python to construct a co-occurrence matrix, then calculate the relationship and weight between two sites through the co-occurrence matrix, and output if there is collinearity. Then filter and delete those with a weight less than 5. Then use the Groupby function in Pandas to implement the grouping function. The purpose is to count the sum of the weights of each place, so as to obtain the weight value of passenger flow between an area and other areas. The size of the regional correlation can be obtained. Finally, by counting each, the weight proportion of the site forms the regional correlation of tourist flow in Hainan.

Through research, the top 30 regional correlations in Hainan Province are shown in *Table 2*. This ranking of regional correlations reveals tourists' travel preferences and habits in Hainan Province and shows the differences in passenger flow between regions within the province.

Table 2. Hainan Province Ranks Among the Top 30 Regions in Terms of “Regional Relevance”

Sort	Regional relations	Sort	Regional relations
1	Sanya – Haitang Bay	16	End of the World – Yalong Bay
2	Sanya – Yalong Bay	17	Sanya – ends of the World
3	Haitang Bay-Yalong Bay	18	Wuzhizhou Island-Haitang Bay
4	Sanya-Sanya Bay	19	End of the World – Haitang Bay
5	Yalong Bay-Sanya Bay	20	End of the World-Sanya Bay
6	Sanya Bay-Haitang Bay	21	Dadonghai-Coconut Dream Corridor
7	Sanya-Dadonghai	22	Yalong Bay-Wuzhizhou Island
8	Dadonghai-Yalong Bay	23	End of the World-Dadonghai
9	Dadonghai-Sanya Bay	24	Wuzhizhou Island-Sanya Bay
10	Dadonghai-Haitang Bay	25	Sanya Bay – the first market
11	Sanya-Coconut Dream Corridor	26	Sanya – the first market
12	Yalong Bay-Coconut Dream Corridor	27	Yalong Bay-Xidao
13	Sanya Bay-Coconut Dream Corridor	28	Sanya Bay – Lover’s Bridge
14	Sanya-Wuzhizhou Island	29	Haitang Bay-First Market
15	Haitang Bay-Coconut Dream Corridor	30	Sanya-Lover Bridge

Source: created by author.

Reportedly, the behavioural information of a single tourist’s spatial transfer may not be enough to form a regional correlation rule about tourist flow, but if multiple tourists enter and exit the same area numerous times and show a tendency to transfer to certain areas (Mou *et al.*, 2020). Through the above analysis method, we can form the behavioural trajectory of tourists in Hainan Province and further infer the regional correlation characteristics of visiting Hainan tourist groups. The data analysis results are as follows: (1) Sanya is the core city in tourism in Hainan Province and the main preferred city for tourists to visit Hainan Province (Chen *et al.*, 2022). (2) After tourists arrive in Sanya City, their main travel habits are the “four major bays” and radiate to the surrounding areas (Wang *et al.*, 2019). (3) The six major areas of Yemeng Corridor, Wuzhizhou Island, End of the World, First Market, West Island, and Lover’s Bridge have a relatively large total outbound passenger flow.

3.1.2 Regional correlation analysis of tourist flow

Travel motivation usually refers to a person’s subjective conditions for travelling, including the tourist’s physical, cultural, and social interaction and other aspects of motivation (Zhina *et al.*, 2018). Relevant scholars believe that the primary motivation of tourists coming to Hainan is “leisure and vacation” (YanJun *et al.*, 2019), including business travel, outdoor experiences, Cultural tourism, integrating into nature, feeling the sun and sea, seeking novelty, escaping from modern cities, etc. (Haibo *et al.*, 2015; Yulan, Xin, 2015; Zhijun, Liqiong, 2007). At the same time, Hainan Province also regards the return of duty-free shopping, the return of students, and the return of overseas medical treatment as the three major factors to attract tourists (Hongjun *et al.*, 2023). Therefore, taking into account the academic research results and the three significant return policies of Hainan Province, this study divides the travel motivations of tourists from Hainan into outdoor project experience categories, duty-free shopping, cultural tourism, leisure vacations, business meetings, sports technology, and education and study abroad, health and wellness tourism, rural tourism, and international medical care. Then, these 10 types of travel motivations for coming to Hainan are imported into the code using the apply function in Pandas. Then the code output results are counted using a dictionary, and finally, the proportion and ranking of travel motivations for coming to Hainan are formed (Table 3). Overall, the tourism motivations of tourists coming to Hainan have shown a diversified development trend (Liu, Choe, 2023), with outdoor project experience as the leader, duty-free shopping, cultural tourism, vacation and leisure as the main focus,

and aerospace technology, health and wellness tourism, business activities and other dimensions. Comprehensive attraction as a tourist destination in Hainan.

Table 3. Hainan Tourists' Motivation for Travel

Ranking	Types of motivations for traveling to Hainan	Proportion	Ranking	Types of motivations for traveling to Hainan	Proportion
1	Outdoor project experience category	28.67%	6	Sports, technology	7.58%
2	Duty-free shopping	15.80%	7	Education study abroad	5.92%
3	cultural tourism	13.74%	8	Wellness tourism	3.48%
4	Leisure, vacation, sightseeing	12.88%	9	rural tourism	1.34%
5	business meeting	9.32%	10	international medical	1.26%

Source: created by author.

3.1.3 Residence time

The stay time of tourists can be roughly divided into three types: day trip (less than 1 day), overnight tourist (more than 1 day but less than 2 days), and multi-day stay (more than 2 days) (Lu, 2008). The study found that the most common stay time for tourists coming to Hainan is 5 days, followed by 7 days, then 1 day, 8 days, 6 days, etc. The length of stay is different and discrete. On average, visitors to Hainan stay for 5-6 days, and multi-day stays are more common (Hu, 2007).

3.2 Analysis of Tourist Destination Image Perception

3.2.1 Cognitive image perception

The cognitive image perception is divided into six dimensions: "tourism attractions, tourism food, tourism products, tourism accommodation, tourism entertainment, and tourism transportation" (Kayat, Abdul Hai, 2014), and then high-frequency words with a word frequency higher than 100 are divided into these dimensions. Each dimension was divided into more detailed cognitive images, and the word frequency proportion of specific image divisions was derived. *Table 4* shows the relevant results.

Table 4. 6-Dimensional Cognitive Image and Its Specific Division

6 dimensions Cognitive image and word frequency proportion	The specific division of cognitive images and word frequency proportions
Travel food (14.91%)	①Seafood (30.42%) ②Fruits (23.38%) ③Betel nut, chicken vine, special snacks (8.42%) ④Afternoon tea, morning tea, dad tea (6.73%) ⑤Wenchang chicken, coconut chicken (4.63%) ⑥Hot pots such as dregs and vinegar (3.37%) ⑦Powders such as Baoluo powder and Hou'an powder (2.11%) ⑧Refreshing and refreshing (2.04%) ⑨Eating venues (11.08%) ⑩Others (7.83%)
Tourist accommodation (12.85%)	①Hotels (59.08%), ②Accommodation facilities (20.35%) ③Accommodation services (6.81%) ④B&Bs (5.60%) ⑤Accommodation room types (5.28%) ⑥Inns and hotels (2.42%) ⑦Others (0.47%)
Tourism transportation (10.27%)	① Airplanes (25.00%) ② Self-driving, rental cars, RVs and other automobiles (16.72%) ③ Ferries and boats (13.57%) ④ Traffic roads (10.28%) ⑤ Buses and buses (6.45%) ⑥ Motor vehicles and high-speed rail, trains (4.93%) ⑦ battery cars, motorcycles (4.77%) ⑧ taxis, taxis (4.25%) ⑨ parking spaces (fields) and other services (4.17%) ⑩ others (9.86%)

Table 4 (continuation). 6-Dimensional Cognitive Image and Its Specific Division

6 dimensions		The specific division of cognitive images and word frequency proportions
Cognitive image and word frequency proportion		
Core tourist attractions (49.86%)		①Climate and natural scenery category (30.39%) ②City category (26.23%) ③Scenic spots, scenic spots, parks category (17.42%) ④Bay category (12.41%) ⑤Island and island category (6.62%) ⑥Culture and technology category (5.18%) ⑥Others (1.75%)
Tourism products (5.17%)		① Duty-free goods (28.49%) ② Services (39.16%) ③ Tickets (23.26%) ④ Travel equipment (3.69%) ⑤ Others (5.39%)
Tourism and entertainment (6.94%)		① Surfing, sailing, yachting, and other marine entertainment projects (32.79%) ② Photography and photography (29.76%) ③ Check-in (10.09%) ④ Diving (9.68%) ⑤ Hiking, camping, and cycling (8.85%) ⑥Sea fishing and fishing (2.70%) ⑦Others (6.13%)

Source: created by author.

Overall, the word frequency of tourist attractions (49.86%) is 167013, accounting for the highest proportion and far exceeding other dimensions. The word frequencies of tourist food (14.91%), tourist accommodation (12.85%), and tourist transportation (10.27%) are respectively 49940, 43057, 34393, tourism entertainment (6.94%) and tourism products (5.17%) have relatively low cognitive images, with word frequencies of 23255 and 17319, respectively.

3.2.2 Emotional image perception

(1) Text content sentiment analysis

The emotional score is obtained by analysing the text's emotional image (Table 5). The larger the emotional score, the stronger the positive emotion, and vice versa. Among the 2148 travel notes, 2130 articles have an emotional value greater than 0.5 as positive emotions (99.2%). 2106 articles have an emotional score greater than 0.9, accounting for 98.0% of the total travel notes. Judging from the text content of tourists' travel notes, most of the emotions of tourists travelling in Hainan Province are positive. Tourists' satisfaction is high. There are also negative emotions, but they account for a relatively small proportion, accounting for only 0.8 of the total texts.

Table 5. Tourist Travelogue Sentiment Analysis

Emotion type		Score range	Number of travel notes (pieces)	Proportion	Proportion
Positive emotions (score > 0.5)		> 0.9	2106	98.0%	99.2%
		0.7-0.9	20	0.9%	
		0.5-0.7	4	0.2%	
Negative emotion (score < 0.5)		0.3-0.5	7	0.3%	0.8%
		0.1-0.3	4	0.2%	
		< 0.1	7	10.3%	

Source: created by author.

Although the proportion of negative emotions is small, it can be seen from the text content that the main factors affecting the negative image of tourism in Hainan Province are as follows: (1) Hotel facilities and management issues (Chu *et al.*, 2020). The main manifestations are unreasonable hotel design, the low-cost performance of hotel restaurants, and inadequate hotel services. (2) Parking is inconvenient (Sia,

Zhu, 2017). Statements such as “parking spaces are difficult to find”, “parking spaces are occupied by locals’ electric vehicles”, “parking is troublesome”, and “parking takes too long” appear frequently in travel notes. (3) Taxi integrity issues (Gui, Wu, 2020). The specific texts are as follows: “The driver who solicits customers not only solicits customers but also deceives people”, “I was tricked into taking a taxi”, “The driver deliberately took a detour”, etc.

(2) Keyword sentiment analysis

To further analyse tourists’ emotional perception, the emotional tendencies of high-frequency words and output emotional scores were scaled (Table 6). The total number of emotional keywords with vocabulary frequency greater than 100 is 94,592, of which 90,866 are positive emotion keywords (96.06%), and 3,726 are negative emotion keywords (3.94%). Table 6 has the top 10 keywords with positive and negative emotional cognitions, along with their corresponding emotional values. “Delicious” and “fresh” are positive evaluations of tourist food. Words such as “like”, “good”, “enjoy”, “paradise”, “beautiful” and “comfortable” also directly express tourists’ feelings toward Hainan Province. Positive affective attitudes towards travel (Zhang, 2010). In contrast, “bad”, “disappointment”, “helpless”, “boring”, “doubt”, etc., express tourists’ negative emotions (Jain *et al.*, 2023).

Table 6. The Top 10 Feature Words With the Highest Frequency of Positive and Negative Emotions in the Sample Text

Positive emotion keywords	Frequency	Emotional value	Negative emotion keywords	Frequency	Emotional value
like	4,588	0.9611	not good	597	0.0610
good	3,928	0.9475	no	313	0.0583
tasty	2,637	0.9401	disappointment	223	0.0296
enjoy	1,867	0.9452	have no choice	198	0.0923
fresh	1,866	0.9189	keep away	183	0.0711
heaven	1,507	0.9354	shortcoming	176	0.0249
beauty	1,422	0.9716	boring	176	0.0255
free	1,360	0.9351	Rubbish	150	0.0163
good	1,208	0.9504	Suspect	129	0.0499
comfortable	1,132	0.9570	Danger	109	0.0989

Source: created by author.

3.2.3 Conative image perception

This study uses the 3 keywords “recommended”, “worthy” and “strongly recommended” as representative words of the conative image. The connotation of “worthy” is “the tourist expresses the willingness to visit the tourist destination”. In the end, the “recommended” vocabulary list had 3,418 words, the “worthy” list had 1,095 words, and the “strongly recommended” list had 186 words. It can be seen from the data results that tourists coming to Hainan generally have a strong willingness to recommend (Sun *et al.*, 2013). Words such as “recommended”, “strongly recommended”, and “worthwhile” indicate that tourists actively agree and are willing to recommend others to travel to Hainan Province. This kind of good Word-of-mouth recommendation effectively enhances the attractiveness of Hainan’s tourist destinations.

4. Discussion

Although the study outcomes are aligned with the literature, there are also specific novel findings, which are illuminated in three different dimensions of travel motivation: emotional image, conative image, and

cognitive image. Certain study findings also contradict the extant studies in some aspects, such as the retention time of visiting Hainan. These findings are worthy of a thorough discussion.

There is a research gap in the literature on the length of stay of tourists in Hainan (He *et al.*, 2023; Zhang *et al.*, 2022). Hence, it is of vital practical and theoretical significance to elucidate the length of stay in Hainan Province. This study reveals that 5-6 days is the average retention time of Ladion, which is consistent with the present literature reflecting a multi-day retention type. Reportedly, Lu (2008) and Hu (2007) also support this research finding. This can be attributed to the fact that, as a whole, Hainan Province forms a differentiated tourism attraction due to its rich key tourism attractions and tourist destination cities with distinct characteristics, such as Sanya and Haikou (Ma *et al.*, 2014). Additionally, in Hainan Province, tourism transportation is both accessible and convenient, while the time cost of transportation between cities is also low. Based on this, tourists show a willingness to experience diverse Hainan customs in different cities (Xie, 2001). Particularly, staying for multiple days in Hainan can lead to experiencing more of Hainan's traditions, cultures, and destinations. In contrast, in other provinces, the transportation cost for travelling to Hainan is comparatively high. As a consequence, the higher transportation costs to Hainan often result in overnight and day-trip tourists (Yao, 2017).

From the tourism motivation perspective, this study shows that outdoor experience is the primary motivation of tourists coming to Hainan (Xu *et al.*, 2019; Xiaona, Weiwei, 2011), including hiking, diving, surfing, cycling, camping, skydiving, and mountain climbing. Nevertheless, prior literature does not draw such deliberate conclusions on outdoor experience. However, scholars such as Haibo *et al.* (2015), Yulan, Xin (2015), and Zhijun, Liqiong (2007) also confirm that different outdoor experiences act as the key tourism motivation for tourists coming to Hainan. The study results outline why the perception of outdoor experience is prominent in tourism by depicting that Hainan not only has virgin forest tourism resources in tropical rainforests but also has island tourism resources surrounded by the sea (Ma, 2021). Such diversity allows diverse outdoor activities while constituting the distinctive attraction of tourist destinations in Hainan. Hanna *et al.* (2019) posit that these destinations have become the core travel motivation for young tourists as outdoor experience activities meet their needs for healthy tourism. The novel implications of this study extend new insights for Hainan Province to generate a more focused tourism positioning. Besides this, the three major return factors encompassing duty-free shopping, studying in Hainan, and international medical care are the main reasons behind the development of the Hainan Free Trade Port. Certainly, duty-free shopping is the core factor attracting tourists. Hainan Province has persistently unleashed the enthusiasm of consumers to a substantial extent, enriched different types of duty-free products, and made duty-free shopping a new travel fashion after the issuance of the "Hainan Free Trade Port Construction Master Plan" and the new tax-free policy for outlying islands in June 2020. However, studying abroad and international medical care in Hainan cannot be taken as the key motivations for coming to Hainan, accounting for only 5.92% and 1.26%, respectively. Since studying abroad in business and international medical care in Hainan has not fully triggered market vitality and is in the initial development phase (Qi *et al.*, 2021).

In the context of the perception of tourist destination image in Hainan Province, the study results fundamentally align with the 3-dimensional theoretical model of "cognition-emotion-intention" of tourist destination image put forward by Gartner (1994). Reportedly, the "climate and natural landscapes" act as the major tourist attractions in terms of the cognitive image of Hainan Province, supporting that the cleanliness, natural scenery, and tourist attractions represent the core cognitive image of Hainan (Chu *et al.*, 2020; Lei *et al.*, 2022). Nonetheless, study conclusions show certain differences in terms of health factors. Presently, tourists coming to Hainan have significantly raised their awareness of climate (Chen

et al., 2017) since the data collection time in this study comprises the pandemic period. Owing to the epidemic's influence, tourists during the travel process show more willingness to encounter the natural landscape and high-quality climate. Meanwhile, the tourism resources of Hainan can effectively meet the travel needs of these tourists with year-round warmth, tropical maritime climate, and excellent air quality (Yu, Jiayi, 2023). Whether during or post-epidemic era, such attributes make Hainan an ideal tourist attraction (Zhang, 2024), contributing to the ranking of "climate and natural landscape" as the main attractions of tourism. As compared to previous studies, from the standpoint of emotional cognition, the ratio of positive emotions among tourists coming to Hainan has substantially increased from 85.57% to 99.2%. Evidently, the ratio of tourists coming to Hainan reflects that the overall satisfaction level of tourists shows gradual improvement. Zhang (2010) also confirms the tourist's experience of positive emotions in Hainan Province as a tourist destination. Nevertheless, there are some negative emotions in specific dimensions such as integrity, transportation, and accommodation. This implies that the tourism market of Hainan still observes undesired events such as fraud or exaggeration. Certain previous studies have also reported the experience of negative emotions by tourists at Hainan (Gui, Wu, 2020; Chu *et al.*, 2020; Sia, Zhu, 2017). Therefore, market supervision still needs to be improved in Hainan as a tourist destination (Hoshiko, 2015).

Conclusions

Based on the network text analysis, this paper collects the online travel notes text data of tourists coming to Hainan, and uses the Python data visualisation method to follow the hierarchical order of "regional correlation of tourist flow-tourism motivation-stay time-cognition-emotion-intention". Thus, this study thoroughly analysed the tourism perceptions and behaviours of tourists visiting Hainan Province and drew the following conclusions:

- (1) Regarding the regional correlation of tourist flows, correlation differences exist between different regions in Hainan Province. Sanya is the core city of tourism in Hainan Province. It is also the city that tourists prefer to visit in Hainan Province. Sanya's travel habits are further divided into the "four major bays". These bays have Sanya's key tourism products and are vital bases for tourists to travel. Hence, both the intra-regional connections between the 4 major bays and the inter-regional connections with other cities are relatively close, reflecting the regional correlation of tourist flows.
- (2) In terms of tourism motivations, the primary motivation for tourists coming to Hainan is outdoor experiences based on "surfing, cycling, hiking, skydiving, diving, camping, and mountain climbing", followed by duty-free shopping. Among the three major return factors, international Medical treatment and studying in Hainan cannot be the primary motivations for coming to Hainan.
- (3) In terms of tourist stay time, the length of stay of tourists coming to Hainan varies and is discrete, but the average stay time is 5-6 days, which is a multi-day stay type.
- (4) In terms of cognitive image perception, among the six cognitive image categories of "tourist core attractions, tourist accommodation, tourist transportation, tourist entertainment, tourist shopping, and tourist food", the cognitive level of tourists coming to Hainan is from heavy to heavy. Lightly: core tourism attractions > tourism food > tourism accommodation > tourism transportation > tourism entertainment > tourism commodities, among which "climate and natural landscape" are the core tourism attractions of Hainan Province.
- (5) In terms of emotional image perception, positive emotions accounted for 99.2% of the emotional analysis of text content, and positive emotional keywords accounted for 96.06% of keyword emotional

analysis. Relatively speaking, there were relatively few negative perceptions, which were mainly concentrated on “accommodation, transportation and integrity”.

(6) In terms of conative image perception, the tourists coming to Hainan not only show satisfaction with their experiences and believe that coming to Hainan is worthwhile, but also show their willingness to encourage others to recommend travel. This also shows that the overall image perception of Hainan Province’s tourist destinations is good, and it can achieve word-of-mouth communication among tourists.

Implications

On theoretical and practical grounds, this paper optimises the textual method of tourism image using empirical analysis, examines the perceived image of tourist destinations of Hainan Province, and formulates the behavioural characteristics of tourists coming to Hainan. Relative to prior studies on tourist destination images, this research comprehensively elucidates the real intentions of tourists and more effectively appraises tourists’ tourist destinations in Hainan in real time. Thus, specific novel insights are offered in this study, evaluating tourist destinations in Hainan Province. From the perspective of tourists’ behaviour and perceived image of the destination, product design and continuous development offer novel ideas to marketers and the tourist industry as a whole, allowing them to develop new products and services aligned with the distinct and emerging needs of tourists. Thus, the study implications extend valuable insights to generate a more focused tourism positioning.

Suggestions

Overall, there is a need to reshape the tourism image positioning of Hainan Province, create a tourist destination business card with a “natural and comfortable climate, and outdoor experience paradise”, emphasising natural factors such as climate in traditional leisure vacation positioning and outdoor experience project factors to make Hainan Province’s tourism image more precise and targeted. Specific improvement suggestions can focus on 2 aspects: tourist routes and tourism promotion.

First, analyse the behaviour patterns of tourists coming to Hainan to create convenient and attractive travel routes. In terms of the regional correlation of tourist flow, it is recommended to increase investment in transportation facilities between the two regions with the highest regional correlation, such as increasing the frequency of public transportation between regions or shortening the interval between public transportation, especially strengthening Traffic management from transportation stations such as Sanya Airport, bullet train station, and train station to Sanya’s four central bays, Wuzhizhou Island, Coconut Dream Corridor, West Island, Tianya Haijiao and other famous scenic spots can effectively alleviate the travel pressure on important transportation roads for tourists and shorten the travel time. Time required between regions. In terms of tourism motivations, it is recommended to fully cater to the tourism motivations of tourists coming to Hainan, meet the outdoor experience needs of tourists traveling to Hainan, and design tourist routes that include outdoor experience projects such as surfing, cycling, hiking, skydiving, diving, camping, and mountain climbing. Allowing tourists to experience the charm of Hainan Province’s ocean, mountain landforms, climate, and other natural resources deeply, forming a differentiated comparison between Hainan Province and other tourist destinations. In terms of stay time, travel agencies can follow the rule that “tourist stay time” is about 5-6 days on average. On the basis of two or two areas that meet tourists’ strong travel preferences, they can focus on introducing tourists’ stay time and travel route preferences. Travel plans to achieve precise marketing.

Secondly, according to the tourist destination perception tendency of tourists coming to Hainan, we should carry out tourism promotion in a focused way and accurately improve their satisfaction in Hainan.

In terms of cognitive image, “tourist core attractions” are the cognitive dimensions of tourist destinations that tourists to Hainan pay the most attention to. Therefore, in the tourism promotion design of Hainan Province, “climate and natural scenery, famous city business cards, famous scenic spots, four major bays, characteristic islands, and characteristic culture” are the key messages to be conveyed to tourists. Additionally, there is a need to connect Hainan Island with world-famous islands such as Hawaii Island in the US and Okinawa Island in Japan to build the cognitive image of Hainan Province as a tourist destination in a way that resonates with the culture of foreign tourists. In terms of emotional image, the analysis found that the negative emotions of tourists coming to Hainan are concentrated in Hainan Province’s traffic management and services. Firstly, in response to phenomena such as taxi “detours”, “cheating”, and “black taxis” in Hainan Province, a formal taxi driver information management system and an online complaint hotline should be established for tourists to protect their rights and interests in a timely manner. On this basis, a reasonable and legal disciplinary system for breach of trust is also indispensable. When the number of complaints against a taxi driver reaches a certain amount or the credit limit is reduced to a certain value, corresponding disciplinary measures will be implemented. Secondly, there are numerous electric bicycles in Hainan Province, and there are irregular driving phenomena causing traffic jams and frequent traffic accidents. Related departments should establish relevant regulations on the parking and passage of electric bicycles and implement them effectively. The analysis of the “tourism transportation” dimension shows that more tourists are travelling by self-driving, and the main reasons for tourists’ negative emotions in the sentiment analysis are parking inconvenience and irregular parking lot management. It is recommended that parking in popular scenic spots and attractions and the number of spaces be increased, and the parking lot should be effectively managed. Regarding conative image, visitors to Hainan should be encouraged to make word-of-mouth recommendations after tourism activities, such as rewarding tourists for sharing their travel experiences through Internet channels. Recommendations and sharing can further strengthen tourists’ perceptions of Hainan Province. It can also stimulate the travel motivation of other potential tourists to Hainan, forming a virtuous cycle of the development of tourist destinations in Hainan Province.

Limitations

This study was specifically carried out in the context of Hainan province. Therefore, the study results cannot be generalised to other tourist destinations in China. Thus, to produce generalised results, future studies should include different Chinese tourist destinations in the study sample. Likewise, although this research analysed tourist behaviour and destination image perception using several main social and psychological factors, economic factors were not emphasised. Therefore, future studies may also consider economic factors while conducting studies on the perception of the image of tourist destinations. Lastly, the study sample does not distinguish foreign tourists from locals. Hence, further studies can distinguish the local and foreign tourists in order to assist tourist marketers and practitioners in devising customised marketing strategies and revitalising sustainable tourism.

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TURISTŲ ELGSENA IR TURIZMO ĮVAIZDIS HAINANO PROVINCIOJE

Xue Zhang

Santrauka. Vystantis turizmui teoriniai tyrimai, skirti turistų elgesiui ir lankomoms vietoms, tampa vis svarbesni. Tačiau šiuo metu trūksta teorinių tyrimų apie konkrečią mikroturizmo sritį Hainano provincijoje. Todėl tyrimo objektu pasirinkti turistai, kurie lankėsi Hainane ir pasidalijo kelionės įspūdžiais. Nuskaitytam tinklui analizuoti pasitelktos „Python“ ir kitos technologijos. Kelionės įspūdžiai sistemingai analizuoti daugiausia dėmesio skiriant turistų elgesio Hainano provincijoje charakteristikų tyrimui atsižvelgiant į tris dimensijas: turistų srauto regioninį aktualumą, kelionės motyvaciją ir buvimo trukmę bei kognityvinį, emocinį ir intencinį įvaizdį. Tyrimo rezultatai apibendrinti pateikiant turistų suvokimą apie Hainano provincijos kaip turistinės vietovės įvaizdį.

Reikšminiai žodžiai: turistų elgsena; turistinės vietovės įvaizdžio suvokimas; kognityvinis įvaizdis; emocinis įvaizdis; intencinis įvaizdis; Hainano provincija.