

Research on the Countermeasures for the Development of "Non-destination Routes" of Chinese Homeport Cruise Products

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ABSTRACT

Chinese cruise tourism products are seriously homogeneous, which significantly limits the sustainability, healthy and rapid development of China's cruise market. The study aims to provide planning suggestions for Chinese "non-destination route" cruise tourism products and increase the diversity of tourism products beyond traditional routes. This study obtains seven attributes of free destination cruise tourism products through expert interviews and literature review. Four of them have two levels, and the other three attributes have only one story. Combined with orthogonal design, eleven alternatives are provided to participants for preference ranking evaluation, and then joint selection modes are applied to analyse the results. The results show that the number of beds is the most important in the relative importance analysis, followed are sailing time, cabin type, and ship type tonnage. It is suggested that the operators arrange the whole itinerary within 1-2 or 3-4 nights when developing cruise tourism production for accessible destination routes to provide tourists with relaxed and comfortable cabin environment, sufficient and pleasant cruise experience, and various island-hopping fun.

Keywords: Homeport cruises, non-destination routes, cruise tourism, cruise products, Chinas Conjoint analysis.

1. INTRODUCTION

The world cruise industry has developed for more than 100 years and has brought considerable economic output value to many countries, regions, and related industries. The Chinese cruise industry has only used more than ten years and has become the first in the Asia-Pacific region and the fourth in the world. China has formed the Yangtze River Delta cruise circle with Shanghai as the core, the Bohai Rim cruise circle with Tianjin as the core, and the Pearl River Delta cruise circle with Guangzhou. Compared with the famous international cruise circles, the three major domestic cruise circles' home port cruise tourism products are single. Japan and South Korea routes occupy a total share. The development of Japan and South Korea routes is affected by many uncertain factors. At the same time, the cruise products are homogenized. The phenomenon is more serious, which essentially limits the Chinese cruise market's sustained, healthy, and rapid development.

Because of the north-south distribution of Chinese cruise home ports, the dimensionality spans large, obviously affecting the seasons. The problems facing include the low level of industrial development, the imperfect industrial chain, the urgent need to solve the high vacancy rate of most cruise terminals, and the economic contribution that needs improvement [1]. To solve this problem, this study intends to make reforms and innovations from the supply side of cruise products from the perspective of Chinese homeport cruise ship "no-destination route" design perspective, from consumer demand. "Non-destination routes" are collectively referred to as "cruise to nowhere". In fact, "non-destination routes" are not really without a "destination", but the cruise ship itself is the destination. The cruise ship does not call at any other port after it departs from the port of departure. The route back to the port of departure after 1~3 nights [2]. The significance of this subject is to provide planning suggestions for homeport cruises' "non-destination routes" based on the actual national conditions of China's tourism, and to

increase the diversity of tourism products other than traditional routes.

The key to developing China's local cruise tourism lies in planning and designing cruise tourism products. During holidays, large-scale competitions, conferences, and exhibitions, transportation and accommodation are often the biggest hotspots and difficulties. The travel time of tourists is the same, and tourists can choose fewer travel modes. If passengers choose road transportation, in order to avoid traffic jams, they often travel in the middle of the night, with meager comfort. If passengers choose railway transportation, because the passenger capacity of the train is fixed, they need to buy tickets earlier, and their flexibility is limited. If passengers choose air transportation, because the airport is often far away, it takes too long, and the capacity is limited, requiring multiple transfers. Because the cruise ship integrates the six characteristics of "food, housing, travel, shopping, and entertainment", it can better meet various needs in space and time at one time. Once my country's "no destination routes" cruise products are enriched, the cruise terminals built and used will be better utilized, the allocation of tourism resources will be optimized, and more possibilities for passengers to travel.

Relying on the advantages of the "golden industry floating on the waterway", combined with the whole travel time of Chinese people and the explosive travel demand, the purpose of this research is to design an innovative cruise product with high economic benefits to solve the blowout, on the one hand effectively, tourism demand, on the one hand, is the status quo of empty docks with no ships operating, and a large number of idle cruise terminal infrastructures.

Conjoint analysis has the advantage of simple data collection procedures. Respondents only need to consider the order of preference [3]. Moreover, conjoint analysis requires respondents to consider the trade-offs or exchanges between attributes rather than asking them directly. The ideal point's attribute level and attribute importance must be practical [4]. Furthermore, the component utility value obtained by the conjoint analysis can be provided as a direct comparison of highly differentiated attributes (such as durability and price, etc.) or non-quantifiable attributes (such as brand name, design, etc.), and these comparisons factors are precisely the problems faced by consumers in purchasing decisions. Therefore, in addition to being used in consumer research, conjoint analysis is also widely used in countermeasure research in other fields. Dellaert, Borgers, and Timmermans [5] also believe that conjoint analysis has been successfully applied in tourism research to describe and predict tourists' choice behaviour.

The above studies all form products based on product attributes and conduct tourist surveys to obtain

the overall preference of the product, and then decompose the importance of related attributes as a discussion of product design. This study will also use a conjoint analysis method to study the preferences and behaviours of potential cruise tourists for "non-destination routes".

Therefore, the practical application value of this subject has three aspects: (1) Analyse the main attributes of Chinese homeport cruise tourism products, enrich the theme cruise tourism products, and provide differentiated services. (2) By studying the preferences of Chinese people for the attributes of cruise tourism products, we can further differentiate customers with different preference structures and provide a reference for relevant industry players in business strategy formulation and product design. (3) Finally, we put forward the countermeasures, measures, and suggestions to develop China's homeport cruise products and "non-destination routes".

2. LITERATURE REVIEW

2.1. "Non-destination routes" cruise travel

The concept of "non-destination routes" cruise travel can be traced back to the 1980s. Godley [6] investigated the views of Chinese and Vietnamese Chinese on summer "non-destination routes" cruise tourism. And this kind of product emerged in the 21st century. Because of its characteristics of cruise tourism and low risk of uncertainty, it is attractive to Asians who have never had cruise tourism experience [7]. At present, there are little researches on cruise travel on both sides of the strait at home and abroad. Due to the new crown pneumonia epidemic, the global cruise industry is nearly shut down. Until August 2020, Star Cruises Discovery Dream was re-launched in Taiwan, using non-destination routes to travel from Keelung Port and pass-through Penghu, Kinmen, Matsu, and other islands.

2.2. Explore the elements of cruise tourism products

Tourism products include tangible attributes and intangible service attributes, such as price, number of days touring, grade, places to visit, and arrangement of means of transportation [8]. However, in the intangible service attribute evaluation, when determining the crucial attributes of the product, all positive and negative factors must be considered, and all decisive vital elements must be included. Interaction and overlap between attributes should also be avoided. To solve this situation, Hair Jr., Black, Babin, and Anderson [9] suggested that all highly relevant attributes can be combined to create super attributes. Therefore, intangible service attributes can be combined with tangible attributes.

On the whole, cruise tourism products are composed of many attributes, such as cruise accommodation facilities, transportation to the cruise, and food for tourists on the cruise. These attributes will become the content that tourists will consider when choosing cruise tourism products. Therefore, general cruise products should include the following product attributes: the cruise itself (features, environment, equipment, services, and proximity to the destination), tourist destinations, travel agencies, ground activities, and connecting transportation.

2.3. Exploring the preferences of cruise tourists

In addition to considering the attributes of tourism products, the attractiveness of the location of the cruise homeport will also affect cruise tourists' choice of tourism products. Inskeep [10] believes that all necessary components of a tourist destination can be regarded as tourist attractors. Tourist attraction is the element of tourism supply, which represents the factor that attracts tourists to travel here [11]. Crouch and Ritchie [12] further explained that tourist attractions could reflect the characteristics and advantages of tourist destinations and are the foundation for the sustainable development of the tourism industry. Like other general consumer products and services, tourist destinations have multidimensional attributes, which can determine the attraction of a particular tourist destination to tourists [13]. In other words, the attraction of the homeport of the cruise ship is related to the attributes of tourist destinations, and these attributes, whether tangible or intangible, physical or potential, can be called tourist attractions, which have the motivation to trigger tourists and meet the needs of tourists.

Sun and Feng [14] pointed out that my country has become a core component of the Asian cruise market with its superior geographical location, unique oriental culture, rich tourism resources, and substantial potential source market. It has received more and more attention from cruise companies. These are all factors contributing to the development of cruise tourism. With the change of people's consumption concept and the continuous increase of disposable income, it is becoming more common for Chinese people to choose cruise tourism. Cruise tourism will indeed develop into a vital tourism industry. Wang and Ye [15] compared the routes and ships of cruise tourism products for cruise companies. The results show that the leading product portfolio of cruise companies currently developing Asia-Pacific cruise routes is: "Conventional routes, single routes, short voyages, fewer voyages, and simplicity Upstream of the shore". Among them, the cruise company attaches the highest importance to the Chinese characteristics, which is in line with cruise tourism product attributes. Consumers' preference for cruise tourism products mainly depends on the features

of the products, individual parts, travel experience, and impression of the destination.

The purpose of this research is to use the conjoint analysis method to explore the possibility of tourists accepting cruises' "no destination routes". In addition to the docking ports, the tourist destinations of cruise tourism mainly refer to the cruise ship itself. Through literature review, it is known that the personal characteristics of tourists, the attributes of cruise tourism products, the attractiveness of tourist destinations, and the familiarity of goals will all affect the preferences of tourists, which in turn affects the planning and design of "non-destination routes".

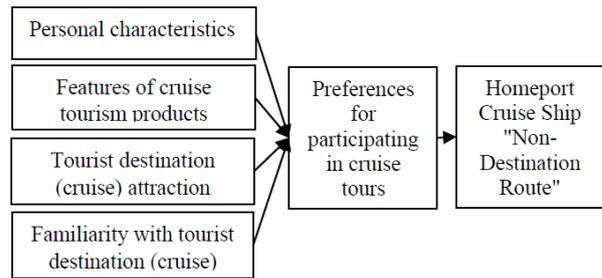


Figure 1 Research framework.

3. RESEARCH METHODS

3.1. Questionnaire design and operational definition of variables

This research is mainly based on a questionnaire survey as the primary research tool, which is divided into three steps:

The expert interview is an investigation method in which the investigator directly contacts the respondent to collect information. It can collect more in-depth information. Primarily through direct face-to-face interviews, you can observe the expert's response at any time and then extend the inquiry and obtain more information for detailed clues.

Through literature review and expert interviews, the crucial attributes related to this research are summarized and sorted out, including "ship tonnage", "cabin type", "number of beds", "stops", "voyage time", "product price", and "service content". After pre-test investigation, the seven attributes of this study and their level content (Table 1) are obtained.

The initial questionnaire of this study was issued in June 2020. A total of 98 questionnaires were distributed, 98 were recovered, 18 invalid questionnaires were deleted, 80 valid questionnaires and the effective sample recovery rate reached %. The content of the formal questionnaire was revised by semantics and items and divided into a survey of the personal characteristics of

tourists and the study of tourists' preference for cruise tourism products on "non-destination routes".

3.2. Research objects and locations

The object of this research is my country's short-term leisure tourists who are willing to consume cruise products on "destination-free routes". Tourists are divided into two groups: those with cruise travel experience and those without cruise travel experience. This study is based on a sample of potential cruise tourists nationwide, due to the suspension of the cruise industry during the COVID-19 period. This study uses online questionnaire surveys, with purposive sampling and snowball sampling. The survey time is during the summer vacation in July 2020 to maximize the effective samples.

3.3. Data analysis method

This study uses SPSS 23 as the primary tool for statistical data analysis. The descriptive statistical analysis describes the concentration and dispersion of sample distribution to understand the sample structure. Use the frequency distribution table to establish the primary data of the research participants, simplify the data, and explain the frequency distribution of the demographic variables of the sample. Chi-square analysis is used to verify the relationship between category scale variables and do independent verification. The independent sample t test examines the differences in the utility values of the components of different study participants. Use single factor variance analysis to study the differences in the component utility values of participants of different ages, occupations, and education levels. Through the conjoint analysis method [16], analyse the preference data of the participants in the non-destination cruise tourism product research to obtain the relative importance of each attribute and the component utility value of each level.

Conjoint analysis is widely used in marketing research and is suitable for measuring the psychological judgments of subjects, such as perceptions and preferences [17-18]. Its technology has also been proven to be a very reliable procedure for assessing consumers' personal preferences. The application of the conjoint analysis method includes the following steps: (1) selection of preference mode, (2) data collection method, (3) establishment of the subject of the overall profile method, (4) presentation of the subject, (5) measurement of strain Scale, (6) estimation method.

4. RESULTS

4.1. Analysis of sample data

In this study, a questionnaire survey was conducted through the Wenjuanxing platform. A total of 348

questionnaires were sent and received. After excluding invalid questionnaires, 196 valid questionnaires were obtained, and the effective sample recovery rate was 56.3%.

As shown in Table 2, East China (n = 70, 35.7%) is the most current area of all study participants, followed by North China (n = 42, 21.4%), and 28 people (28.6%) from Hong Kong, Macao, and Taiwan. The majority are under 30 years old (n = 84, 42.9%), followed by 31-40 years old (n = 68, 34.7%). There are more women (n = 128, 65.3%) and 68 men (34.7%). Most occupations are military and public education (n = 62, 31.6%), followed by 44 people in the service industry (22.4%). The education level is mostly college/undergraduate (n = 112, 57.1%). More married people (n = 112, 57.1%), and 84 unmarried people (42.9%). The monthly income of study participants was less than RMB 5,000 (n = 86, 43.9%), followed by RMB 5,001 to 10,000 (n = 58, 29.6%).

The study participants' most preferred type of travel is self-guided travel (n = 132, 67.3%), followed by semi-self-service trips (n = 44, 22.4%). In terms of the cruise travel experience of the study participants, half of them had never engaged in cruise travel (n = 98, 50.0%); followed by 1-3 cruise travel experiences (n = 68, 34.7%). The most recent time on cruise travel was more than RMB 3,000 (n = 42, 21.4%), followed by less than RMB 1,000 (n = 38, 19.4%). 106 people (54.0%) may be engaged in cruise travel in the next year. The sample distribution in this study is consistent with Dai, Feng, and Shi's [19] and Feng and Dai's [20] results.

4.2. Analysis of the preference structure of potential tourists' cruise tourism products on non-destination routes

According to 196 study participants, the preference ranking order of the 11 groups of non-destination cruise tourism product portfolios in this study, through conjoint analysis, can be used to obtain the relative importance of 4 attributes and 8 of the non-destination cruise tourism. In the analysis of relative importance, the number of beds (34.333) has the highest relative importance, followed by sailing time (30.060), cabin type (19.633), and ship type tonnage (15.974). In addition, according to the component utility value of each attribute level (Table 3), in terms of ship type and tonnage, the participants in this study prefer ships of "under 70,000 tons"; in terms of cabin types, participants in this study prefer "Ocean view room"; in terms of the number of beds, the participants in this study prefer a "three-person room"; in terms of sailing time, the participants in this study prefer "1-2 nights". Therefore, it is learned that the most preferred non-destination cruise travel product portfolio of the participants in this study is: cruises of less than 70,000 tons + sea view room + triple room + 1-2 nights + jump

(island hopping, port hopping) Mid-stop + four-five-star (entertainment-oriented) + ample and diverse shore entertainment + RMB 1001-2000/person.

This study then analyses the variables that have different preferences in personal characteristics. They are described as follows: People under 30 prefer ships and two-person rooms with 70,000 to 100,000 tons, and 31-40 years old prefer boats with less than 70,000 tons + three Human rooms. Men prefer cruise ships of less than 70,000 tons than women. Graduate students (master's, doctorate) prefer sea-view rooms to high school/secondary vocational qualifications. Postgraduate students (master and doctorate) prefer 1-2-night trips to high school/vocational and junior college/undergraduate degrees. Those with college/undergraduate degrees prefer 1-2-night trips to high school/secondary education. People with a monthly income of RMB 5001-10000 prefer cruise ships of less than 70,000 tons than those with a monthly income of more than RMB 20,000. People with a monthly income of less than RMB 5,000 prefer a two-person room to those with a monthly income of RMB 5001-10000. People with a monthly income of RMB 5001-10000 prefer to sail for 1-2 nights than those with a monthly income of less than RMB 5000. Those with more than four cruise experiences will prefer a triple room with a sea view balcony and sail for 1-2 nights than those with 1-3 experience. Inexperienced people prefer two-person rooms with sea view balconies to those with 4-6 times experience.

4.3. Cluster analysis

After the component utility value of each level is obtained through conjoint analysis, cluster analysis can be used to segment the market, and the research participants with high component utility value can be integrated into a group to facilitate future marketing strategies. In this study, the cluster analysis was performed using the centroid clustering method in the hierarchical clustering method to determine the ideal number of clusters. Then the non-hierarchical clustering method K-means method was used to participate in all studies. The participants are divided into groups one by one. The study results show that 196 study participants can be divided into two clusters, which shows that the two clusters have significant differences in preference for non-destination cruises. The researchers named them pragmatic-oriented tourists and recreation-oriented tourists, as shown in Table 4.

In the analysis of relative importance of cluster one (pragmatic-oriented tourists), the number of beds (34.220) has the highest relative importance, followed by sailing time (27.598), cabin type (20.240), and ship type tonnage (17.942). Furthermore, according to the component utility value of each attribute level, in the tourism itinerary characteristics of cruise tourism

products on non-destination routes, cluster one prefers ships of less than 70,000 tons in terms of ship type tonnage; in terms of cabin type, it is more preferred Sea view room; in the number of beds, prefer a triple room; prefer 1-2 nights during sailing time. Therefore, cluster one's most preferred non-destination cruise travel product portfolio is: "Ship less than 70,000 tons + sea view room + triple room + 1-2-night cruise + jump (island hopping, port hopping) stops + Four-five-star (entertainment-oriented) + sufficient and diverse shore entertainment + RMB 1001-2000/person". Pragmatic-oriented tourists prefer to control their budgets, use the holiday to go out with the whole family, and spend leisure time with the least amount of time to experience the onboard service.

In the analysis of relative importance of cluster two (recreation-oriented tourists), the number of beds (34.527) has the highest relative importance, followed by sailing time (34.310), cabin type (18.588), and ship type tonnage (12.585). Furthermore, according to the component utility value of each attribute level, it can be known that in the tourism itinerary characteristics of cruise ship tourism products on non-destination routes, cluster two prefers ships of 70,000 to 100,000 tons in terms of ship tonnage; in terms of cabin type, I prefer sea-view balcony rooms; for the number of beds, I prefer two-person rooms; I prefer 3-4 nights during sailing time. Therefore, the most preferred non-destination cruise travel product portfolio for cluster two is: "70,000-100,000 tons of ships + sea view balcony room + two-person room + 3-4-night voyage + jump style (island hopping, port hopping) Mid-stop + four-five-star (entertainment-based) + ample and diverse shore entertainment + RMB 1001-2000/person". Recreation-oriented tourists prefer to experience all the services and facilities on board and ashore as much as possible and take advantage of vacation couples to travel and spend more time to experience the entertainment experience of cruise travel fully.

5. CONCLUSIONS

The primary purpose of this study is to explore the attributes of products and the relative importance of each product when potential cruise tourists choose cruise products on non-destination routes, to understand tourists' preference for cruise products on non-destination routes, and further Separate markets with different cluster preference structures for reference by related businesses in their business strategies.

Through the chi-square analysis and verification, this study found that "pragmatic-oriented" and "recreation-oriented" tourists have significant differences in variables such as age, occupation, education level, monthly income, and cruise travel experience. Under the age of 40, occupations belong to service industry, military public education, professional

personnel, junior college/undergraduate and postgraduate education, and monthly income below RMB 10,000 are mostly pragmatic-oriented. Based on the above, it is of substantial significance to use different ages, occupations, education levels, monthly revenues, and cruise travel. In the future, when operators collect basic personal information of tourists, they should consider further big data analysis to make more refined market segmentation.

6. IMPLICATON AND SUGGESTIONS

6.1. Research Implication

This study found that the most preferred non-destination cruise product portfolio for potential tourists is "Cruises under 70,000 tons, sea view two-person room, price RMB 1001-2000 /person, 1-2-night itinerary, four-five-star onboard service (entertainment-oriented), hopping (island hopping, port hopping) stop, sufficient and diverse shore leisure and entertainment", can be used as a reference combination for the promotion of cruise tourism products on non-destination routes in the future. From the analysis of the preference structure of cruise ship tourism products on non-destination routes, it is understood that tourists pay

attention to the "ship type tonnage" of less than 70,000 tons, the "cabin type" is a sea-view room, and the "number of beds" is a triple room. In addition to the analysis of demographic data, it is found that the most preference pattern of tourists engaged in non-destination cruises is independent travel. In summary, the industry should consider the preferences of potential tourists in my country, arrange small weekend-length non-destination cruise cruises, and need to place land recreational activities.

6.2. Limitations and future research suggestions

Due to the many attributes and levels of non-destination cruise tourism products, this research only obtains important attributes through literature review and summary. It sets the level based on the current development of cruise tourism in my country, without considering other unused attributes The influence on the choice of non-destination cruise ship tourism products. Therefore, it is suggested that subsequent researchers continue to explore the impact of other relevant attributes and levels on consumers to expand the connotation of non-destination cruise products.

Table 1. Attributes and levels of cruise tourism products on "non-destination routes"

Attribute	Level
Ship type tonnage size	below 70,000 tons
	70,000-100,000 tons
Cabin Type	Sea View Room
	Balcony Room with Sea View
Number of beds	Double room
	Triple room
Stops	skipping (island-hopping, port-hopping) stop
Sailing time	1-2 nights
	3-4 nights
Product price	(Couple room) 1001-2000 RMB/person
Service content	four-five-star (mainly entertainment)

Table 2. Attributes and levels of cruise tourism products on "non-destination routes"

Variables	Items	number(%)	Variables	Items	number(%)
Current living area	North-east area of China	10(5.1)	Occupation	Agriculture, forestry, fishery, animal husbandry, industry, commerce	24(12.2)
	North China	42(21.4)		Service industry	44(22.4)
	East China	70(35.7)		Military, public administration, education	62(31.6)
	Central China	20(10.2)		Professionals (scientists, engineers, lawyers, physicians, accountants, etc.)	24(12.2)
	South China	20(10.2)		Others (including students, freelance work, retirement, homemakers, etc.)	42(21.5)

	Western Region of China	6(3.1)	Education level	High school/vocational school	16(8.2)
	Others	28(14.3)		College/Undergraduate	112(57.1)
Age	Under 31-year-old	84(42.9)	Monthly income	Postgraduate (Master, PhD)	68(34.7)
	31-40 years-old	68(34.7)		Less than 5000 RMB	86(43.9)
	41-50 years-old	32(6.3)		5001-10000 RMB	58(29.6)
	More than 50-year-old	12(6.2)		10001-20000 RMB	28(14.3)
Gender	Male	68(34.7)	The cost of the most recent cruise travel	More than 20000 RMB	24(12.2)
	Female	128(65.3)		No experience in cruise travel	98(50)
Marital status	Single	84(42.9)	Possibility to engage in cruise tourism in the next year	Less than 1000 RMB	38(19.4)
	Married	112(57.1)		1001-3000 RMB	18(9.2)
Experience in cruise travel	0 time	98(50)	Experience in cruise travel	More than 3000 RMB	42(21.4)
	1-3 times	68(34.7)		Very possible	24(12.2)
	4 times or more	30(7.1)		Possible	82(41.8)
Preferred travel style	Group travel	20(10.2)	Preferred travel style	Ordinary	38(19.4)
	Semi-self-service travel	44(22.4)		Impossible	38(19.4)
	Independent travel	132(67.3)		Very unlikely	14(7.1)

Table 3. Analysis of the preference structure of cruise tourism products on non-destination routes

Attribute	Relative importance	Levels	Component utility value	Preference
Ship type tonnage size	15.974	below 70,000 tons	0.037	v
		70,000-100,000 tons	-0.037	
Cabin Type	19.633	Sea View Room	0.121	v
		Balcony Room with Sea View	-0.121	
Number of beds	34.333	Double room	-0.315	
		Triple room	0.315	v
Sailing time	30.060	1-2 nights	0.166	v
		3-4 nights	-0.166	

Note: Pearson's R=.899. The larger the correlation coefficient, the better the model fit.

Table 4. Analysis table of independent sample t-test results of clusters and preferences

	Levels	Average component utility value				t-value
		Pragmatic oriented tourists (n=124)	Preference	Recreation-oriented tourists (n=72)	Preference	
Ship type tonnage size	Below 70,000 tons	0.0660	v	-0.0135		0.677
	70,000-100,000 tons	-0.0660		0.0135	v	-0.677
Cabin Type	Sea view room	0.6545	v	-0.7967		15.029*
	Balcony Room with Sea View	-0.6545		0.7967	v	-15.029*
Number of beds	Double room	-1.4179		1.5837	v	-19.737*
	Triple room	1.4179	v	-1.5837		19.737
Sailing time	1-2 nights	1.1598	v	-1.5467		21.532*
	3-4 nights	-1.1598		1.5467	v	-21.532*

Note: *p<0.05.

AUTHORS' CONTRIBUTIONS

Y-YD contributed to the research conceptualization, methodology, formal analysis, validation, and writing - original draft. FD contributed to methodology and data analysis. XF contributed to the research administration for the empirical project, resources, and investigation.

YL contributed to the supervision and coordinating tasks. HW contributed to the communication with research objects and data collection.

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