

Research on Perceived Image of Beijing Night Tourism Based on Fuzzy Comprehensive Evaluation

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ABSTRACT

Night tourism is gradually becoming a new model to promote the upgrading and development of tourism destinations. This paper constructs an index system for Beijing night tourism perception image based on literature analysis, collects tourist perception data through questionnaire survey, and analyzes Beijing night tourism perception image using fuzzy comprehensive evaluation method. The research results are as follows: (1) Tourists have a good overall perception of Beijing's night tourism image; (2) The satisfaction of "emotional image" and "overall image" is relatively high; "shopping", "infrastructure" and "catering" have reached the general level of satisfaction. "Night lighting", "leisure tourism activities" and "traffic" are less satisfied, which is mainly reflected in the inconspicuous theme features and poor coordination with the environment in night lighting, fewer types and inconspicuous cultural features in leisure tourism activities, as well as inconvenience and chaos in traffic. Finally, some suggestions are put forward for the development of night tourism in Beijing.

Keywords: *Night tourism, Perceived image, Fuzzy comprehensive evaluation, Beijing.*

1. INTRODUCTION

Night tourism caters to the living habits of modern people, shows tourists a new scene different from the daytime, and greatly improves the traditional tourism mode. At the same time, the development of night tourism prolongs the stay time of tourists, increases their consumption opportunities, and promotes the effective utilization of various resources, so as to promote the linkage development of tourism industry. Domestic research on night tourism began in the early 21st century. Deng Yongyong et al. (2011) first made a research review on night tourism, defined the concept of night tourism, and summarized the relevant content of night tourism products in China in the past 10 years [1]. On the whole, the research scope of night tourism in China is relatively small, focusing more on the current situation of night tourism products and development strategies [2], and focus on descriptive research [3].

Tourism image is a synthesis of tourists' experience perception and emotional evaluation of various elements of tourist destinations [4]. Tourism image is not only a key factor to attract tourists, but also plays an important role in the development of tourist destinations [5]. In recent years, Beijing has put forward relevant countermeasures to promote the development of night

tourism. However, from the perspective of overall development, there are still some problems in Beijing night tourism. Therefore, it is of great significance to analyze the image of Beijing night tourism. This article is based on the construction of Beijing night tourism image index system, using fuzzy comprehensive evaluation method to analyze the image of Beijing night tourism, and put forward suggestions for the development of Beijing night tourism.

2. RESEARCH DESIGN

2.1. Index System

Tourists' perception of tourism image is usually composed of multiple factors. Constructing a framework of tourism perception image index is an important foundation and premise for studying tourism perception image. This paper is based on the "cognition-emotion-whole" three-dimensional structure model. Among them, the cognitive image is based on the six elements of tourism, referring to relevant literature, and combining the characteristics of Beijing night tourism to obtain 6 first-level indicators and 23 second-level indicators. The measurement of emotional image refers to Su Yiwei's (2018) research results on

the perceived image of tourism destinations in Beijing, and 5 second-level indicators are obtained [6]. Five second-level indicators are set up to measure tourists' satisfaction with the overall impression of Beijing night tourism. In summary, Beijing's night tourism perception image index system includes 8 first-level indicators and 33 second-level indicators (Table 1).

2.2. Questionnaire Design and Data Collection

In this paper, the survey of Beijing night tourism perception image is conducted by questionnaire survey. The questionnaire is divided into two parts: the first part is the basic information of tourists, and the second part is the tourists' perception of Beijing's night tourism image. The questionnaire items were designed with the five-level Likert scale. The questionnaire was distributed offline and online. The off-line survey site selected Beijing night tourism typical places, taking Wangfujing as an example, 26 questionnaires were collected offline and 47 questionnaires were collected online. A total of 73 samples were obtained, 4 invalid questionnaires were excluded, and 69 valid questionnaires were collected.

In order to ensure the scientificity of the questionnaire, the most commonly used Alpha coefficient is used to analyze the reliability of each indicator. The result shows that the Alpha coefficient is 0.943, and the reliability coefficient values are greater than 0.70, indicating that the reliability is good. Secondly, paired sample t-test was conducted on the above indicators. The purpose of the sample t-test is to compare the mean difference of the factors and test whether the factors are homogenous. The result shows that there are significant differences among the indicators.

2.3. Research Method

Fuzzy comprehensive evaluation method is a comprehensive evaluation method based on fuzzy mathematics. The comprehensive evaluation method transforms qualitative evaluation into quantitative evaluation based on the membership degree theory of fuzzy mathematics, that is, using fuzzy mathematics to make an overall evaluation of things or objects restricted by multiple factors. It has the characteristics of clear result and strong systematization. It can solve the fuzzy and difficult to quantify problems, and is suitable for the solution of various uncertain problems. This paper uses fuzzy comprehensive evaluation method to study the image of Beijing night tourism.

3. ANALYSIS ON THE PERCEIVED IMAGE OF BEIJING NIGHT TOURISM

3.1. Perceived Image Evaluation Calculation Process

According to the construction method of the fuzzy comprehensive evaluation model, combined with the data collected by the questionnaire, the fuzzy comprehensive evaluation of the perceived image of Beijing night tourism was calculated. The calculation process are as follows:

(1) Set up evaluation factor set and evaluation index set. Let $B = (B_1, B_2, \dots, B_S)$ is the set of evaluation factors, $U_S = (U^S_1, U^S_2, U^S_M)$ is the evaluation index set.

(2) Establish a collection of indicators and comments. The questionnaire in this paper uses a five-level Likert scale, so the comment set is $V = (V_1, V_2, V_3, V_4, V_5) = (\text{very dissatisfied, dissatisfied, neutral, satisfied, very satisfied}) = (1, 2, 3, 4, 5)$.

(3) Determine the weight of each evaluation index. The entropy method is used to calculate the index weight of Beijing night tourism perception image evaluation system. The weight of each index is shown in Table 1, and the weight vector w is constructed.

(4) Construct a fuzzy relationship matrix $R = (r_{ij})_{m \times n}$, where r_{ij} is the membership degree of the evaluation index. Obtain the membership degree of Beijing night tourist perception image evaluation index (Table 2), and construct the fuzzy relationship matrix R .

(5) Establish fuzzy operators for fuzzy comprehensive evaluation. Determine the fuzzy operator according to the index weight obtained in the first two steps and the fuzzy relationship matrix R , $Z_i = w_i \times r_i$, and construct the fuzzy number set Z .

(6) Deblurring the index score. According to the formula $Q = Z \times V$, the score of each index and the comprehensive score are calculated.

The calculation results show that the fuzzy comprehensive score of Beijing night tourism perception is 3.621, and the scores from T1 to T8 are 3.430, 3.653, 3.347, 3.783, 3.702, 3.310, 3.867, and 3.811 respectively.

Table 1. The perceived image index system of Beijing night tourism

First-level indicator	First-level indicator weight	Second-level indicator	Second-level indicator weight
T1 Night lighting	0.123	T11 Bright	0.285
		T12 Beautiful	0.222
		T13 Integration with environment	0.261
		T14 Prominent theme	0.232
T2 Catering	0.096	T21 Rich variety	0.251
		T22 Moderate price	0.230
		T23 Outstanding local characteristics	0.273
		T24 Good hygiene condition	0.246
T3 Leisure tourism activities	0.145	T31 Rich variety	0.218
		T32 Moderate price	0.229
		T33 Outstanding local characteristics	0.266
		T34 Cultural	0.287
T4 Shopping	0.098	T41 Moderate price	0.220
		T42 Outstanding features	0.253
		T43 Good quality	0.237
		T44 Good environment	0.290
T5 Infrastructure	0.126	T51 Good sanitary condition	0.234
		T52 High security	0.284
		T53 Clear tourism identification system	0.252
		T54 Complete public facilities	0.231
T6 Traffic	0.106	T61 Convenient transportation	0.362
		T62 Smooth and orderly traffic	0.330
		T63 Traffic comfort	0.308
T7 Emotional image	0.149	T71 Bustling	0.194
		T72 Patriotism and national pride	0.134
		T73 Pleasant and relaxing	0.177
		T74 International pluralism	0.249
		T75 Rich cultural connotation	0.245
T8 Overall image	0.157	T81 Good overall image	0.246
		T82 Good service	0.203
		T83 Friendly attitude of residents	0.132
		T84 Operating hours of night tourist places	0.186
		T85 High reputation of night tourism	0.233

3.2. Fuzzy Comprehensive Analysis

3.2.1. Analysis of Fuzzy Comprehensive Overall Score

On the whole, the fuzzy comprehensive score of Beijing night tourism tourists' perception is 3.621, which indicates that tourists' perception of Beijing night tourism is generally good. According to relevant reports, the demand for night travel in Beijing ranks first in China, and the development level of Beijing's night tourism is higher than that of other regions. However, there is still a large space for improvement and development in the future.

3.2.2. Fuzzy Comprehensive Analysis of First-level Indicator

The comprehensive scores of "emotional image" and "overall image" are 3.867 and 3.811 respectively, which are at a relatively high level. Relying on its political and cultural center and the background of an international metropolis, Beijing has a profound cultural heritage and rich night tourism resources, attracting many tourists to

come here, so tourists have a good overall perception of the emotional image and overall image of Beijing night tourism.

The comprehensive scores of "shopping", "infrastructure" and "catering" are 3.783, 3.702, and 3.653 respectively, which are at the average level. First of all, although some well-known shopping districts such as Wangfujing and Sanlitun have been formed in Beijing, some tourists believe that there are problems such as excessive shopping prices and lack of distinctive shopping features. Secondly, because night tourism in Beijing is still in the preliminary stage of development, the relevant infrastructure and supporting public services are relatively backward, which cannot fully meet the basic needs of tourists. In addition, experiencing food is also an important motivation for tourists to participate in night tourism activities. Tourists generally believe that there are more varieties of catering, but the high prices and poor sanitary conditions often make tourists dissatisfied.

The comprehensive scores of "night lighting", "leisure tourism activities" and "traffic" were 3.430, 3.347, and 3.310 respectively, which are at a low level.

Due to the particularity of the unfolding time, night tourism activities have higher requirements for lighting. The reasons why tourists are less satisfied with the “night lighting” are that the lighting of some night tourist activities is not bright enough, which leads to the lack of security; the second is the poor coordination of lighting colors, styles and the surrounding environment, and the lighting theme features are not prominent. In addition, tourists believe that the richness of night tourism activities in Beijing still needs to be improved. At the same time, night tourism is an indispensable part of tourists’ integration into the destination life. They hope to experience the local characteristic culture in the process of experiencing night tourism activities. Tourists have the lowest scores on the perception of “traffic”, indicating that traffic conditions have become an important factor hindering the development of night tourism in Beijing, especially the convenience and orderliness of traffic urgently need to be improved.

4. CONCLUSION AND SUGGESTIONS

4.1. Conclusion

Based on previous research results, this paper constructs the index system of Beijing night tourism image, collects tourists’ perception data through questionnaire survey, and analyzes Beijing night tourism image by fuzzy comprehensive evaluation method. According to the results, tourists have a good perception of Beijing's night tourism image. Specifically, the satisfaction of “emotional image” and “overall image” is relatively high and should be maintained in the future. Tourists are less satisfied with “night lights”, “recreation activities” and “traffic”. Among them, the theme of night lighting is not prominent and night lighting has poor coordination with the surrounding environment. The richness and cultural characteristics of leisure tourism activities cannot meet the needs of tourists. It is worth noting that the inconvenient and disorderly transportation of Beijing night tourism makes tourists feel very dissatisfied and urgently needs to be improved. In addition, “shopping”, “infrastructure” and “catering” have reached the general level of satisfaction, which should also be concerned by government departments

Table 2. Index membership degree

First-level indicator	Second-level indicator	Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied
T1	T11	0.188	0.377	0.304	0.130	0.001
	T12	0.159	0.333	0.406	0.101	0.001
	T13	0.116	0.217	0.435	0.203	0.029
	T14	0.145	0.261	0.406	0.174	0.014
T2	T21	0.362	0.290	0.261	0.087	0.001
	T22	0.130	0.232	0.420	0.174	0.043
	T23	0.246	0.348	0.319	0.087	0.001
	T24	0.174	0.362	0.406	0.058	0.001
T3	T31	0.145	0.275	0.406	0.159	0.014
	T32	0.101	0.246	0.507	0.145	0.001
	T33	0.174	0.362	0.348	0.116	0.001
	T34	0.072	0.217	0.522	0.145	0.043
T4	T41	0.217	0.362	0.333	0.072	0.014
	T42	0.246	0.333	0.304	0.116	0.001
	T43	0.275	0.377	0.290	0.058	0.001
	T44	0.217	0.478	0.232	0.072	0.001
T5	T51	0.261	0.319	0.304	0.101	0.014
	T52	0.174	0.377	0.377	0.072	0.001
	T53	0.275	0.333	0.275	0.101	0.014
	T54	0.261	0.290	0.333	0.116	0.001
T6	T61	0.130	0.261	0.377	0.203	0.029
	T62	0.087	0.188	0.464	0.217	0.043
	T63	0.174	0.362	0.391	0.072	0.001
T7	T71	0.362	0.319	0.275	0.043	0.001
	T72	0.188	0.333	0.377	0.087	0.014
	T73	0.333	0.348	0.232	0.058	0.029
	T74	0.391	0.304	0.304	0.001	0.001
	T75	0.261	0.275	0.348	0.101	0.014
T8	T81	0.290	0.406	0.261	0.043	0.001
	T82	0.333	0.290	0.261	0.087	0.029
	T83	0.188	0.377	0.391	0.043	0.001
	T84	0.217	0.246	0.391	0.116	0.029
	T85	0.377	0.290	0.261	0.072	0.001

4.2. Suggestions

First, create unique night lighting. The lighting of the scenic spot should follow the principles of urban lighting construction, combined with the characteristics of the scenic spot, and comprehensively consider the color, lamp material, and lamp shape, so that the night tourism lighting can be integrated with the environment. In addition, the theme of night lighting should be prominent, reflecting the local characteristics.

Second, enrich night tourism activities. Beijing should enrich the local night tourism resources and innovate night tourism activities according to its own characteristics and urban tourism image positioning. At the same time, the flexible adjustment of the business hours of tourism places can meet the needs of tourists to obtain more abundant tourism experience in limited time.

Third, improve the traffic environment for night tourism. Traffic safety and smooth traffic are common problems in tourism. For night tourism, these problems are more prominent and acute. Especially during the peak period of commuting and traffic flow, the transportation department should strictly investigate violations of traffic rules and regulations, and regulate the behavior of drivers and pedestrians. In addition, special tourist trains and through train lines in scenic spots will be added to enhance the accessibility of night tourist places and realize the integration of transportation and travel.

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