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# VISUAL ASSESSMENT OF PSYCHOLOGICAL CAPACITY AND EMOTIONAL PERCEPTION OF TOURISTS AT NATIONAL-LEVEL SCENIC SPOTS

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## Abstract

*Despite the recent boom in tourism in China, there is a severe lack of research into the psychological capacity and emotional perception of tourists in national-level scenic spots. Taking Changzhou Chunqiu Yancheng scenic spot as an example, this paper visually assesses the psychological capacity of tourists in national-level scenic spots and identifies its influencing factors. The author conducted a questionnaire survey on the scenic spot, and performed regression analysis on the survey data. The results show that the psychological acceptance of tourists decreases monotonically with the growing number of tourists in the scenic spot; the tourists' perception of psychological emotions plunged, as the number of tourists on visual assessment photo increased from 30 to 50; the scenic spot should intervene if the psychological acceptance dropped to or below level 4; tourism motivation has a significant influence on the psychological capacity of tourists. The research findings provide a reference for the management of tourists' psychological capacity in national-level scenic spots.*

**Key words:** Psychological Capacity, Emotional Perception, Tourists, Visual Assessment.

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## INTRODUCTION

Since the beginning of the 21st century, China's tourism industry has developed rapidly, which greatly promotes the country's economic development and prosperity. However, the development of tourism has also brought many negative effects, such as natural environmental pollution, destruction of tourism resources, and reduced quality of landscape culture. The green and sustainable development of tourism resources have been faced with enormous challenges (Ikiz, Sato, Arik et al., 2016). Among these, the problems of crowded tourists and overloaded scenic spots are particularly serious, which have turned into the key issues for the scenic area management department. Especially in holidays, the passenger traffic increases at a certain rate every year, and it has increased by

8.7 times between 2012 and 2017 (Namba, Kuwano, Kinoshita et al., 1997).

During the peak travel period, the capacity of the scenic spot is continuously overdrawn. The large increase in the number of tourists has caused a series of problems such as traffic congestion, tight accommodation, and serious crowding in the scenic spots, further leading to a sharp decline in the tourist experience (Livingston & Bolton, 1943). Therefore, in order to improve the ecological environment quality of tourist attractions, and establish a good reputation among tourists, the scenic area management department and related scientific research workers are committed to study the phenomenon of capacity overload and its influencing factors, and explore the management method according to the psychological capacity and emotional perception of tourists, in order to improve the quality of tourists' sightseeing experience. However, the current tourism capacity theory focuses on the exploration of ecological capacity and spatial

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capacity, but the lack of research on the psychological capacity and emotional perception of tourists themselves (Arizono, Morita, Iizuka et al., 2001). The main reason is the high uncertainty of the psychological capacity of tourists affected by subjective consciousness, making it difficult to be measured. In general, relative to the booming development of the tourism industry, the study on the psychological capacity of tourists significantly lags behind (Zhang, 2014).

In the 1970s, Hoge first proposed the concept of tourism carrying capacity (TCC), which is summarized as the amount of tourism use that can provide tourists with normal sightseeing quality in a certain period of time (Hoge & Hirschman, 1984). From the two levels of aesthetic capacity and bio-capacity, Ahmed explained that TCC refers to the maximum capacity of tourists in the scenic spot under the premise that the quality of tourism is still above the psychological bottom line of tourists (Ahmed, 1989). Based on the theory of sustainable development, Lee established the ACV scenic tourism carrying capacity model (Lee, Lee, & Jeon, 2017). Fukuzumi proposed on the basis of the ACV model that the TCC of the scenic spot is mainly reflected in the capacity of the natural environment, the sedimentation thickness of the social spiritual culture, and the economic output ratio of the scenic area management (Fukuzumi, Yamazaki, Kamijo et al., 1998). In 2012, Li divided the TCC into two major categories: natural and social capacity, in which the social capacity was sub-divided into the degree of disturbance to the local residents and the tourist experience. At this time, the definition of the tourist's psychological capacity emerged (Li, Yang, He et al., 2012).

Based on the basic principles of tourism psychology and crowding theory, Rekom used the subjective psychological feelings of tourists as the basis for evaluation, and studied the maximum psychological carrying capacity of tourists in the scenic spot while maintaining the quality of tourists' tourism (Van Rekom, 1995). With reference to related literatures, Wen summarized the main factors affecting the psychological capacity of tourists: The planning layout of the tourist area, the natural humanistic connotation of the scenic spot, the travel motivation of the tourists themselves, the personal aesthetic psychology, and whether it is the peak period of tourism, etc. (Che, Yu Chen et

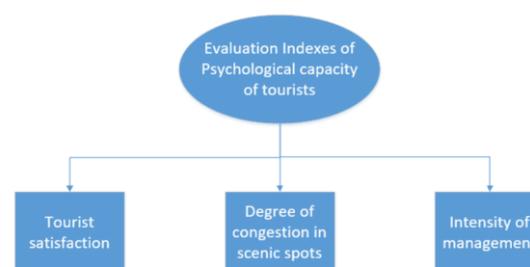
al., 2010). Murray conducted empirical research using the marginal effect method, and concluded that when the marginal utility is zero at the extreme point of the tourist's psychological capacity, the psychological capacity of the tourists is the highest in the region, which is the most economically feasible for the management of the tourist attractions (Murray, 1978).

Due to the uncertainty for the psychological capacity of tourists, the difficulty of calculation, and the lack of empirical application, the domestic research on the psychological capacity of tourists is obviously lagging behind the development of the tourism industry. Based on the visual assessment method, this paper conducts empirical research on the psychological capacity of tourists in the national scenic spot and also its influencing factors by means of questionnaire survey and mathematical statistics. It selects the Chunqiu Yancheng scenic spot of Changzhou as an example.

## TOURISTS' PSYCHOLOGICAL CAPACITY THEORY

### Evaluation index of tourists' psychological capacity

Figure 1. Schematic diagram of evaluation indexes of Psychological capacity of tourists



The psychological capacity of tourists refers to the maximum capacity that the tourism area can bear in the tourist's subjective view on the premise that the natural landscape and social and cultural quality of the scenic spots are not reduced and the tourist experience can be improved within a certain time and space, which can be quantified as the maximum number of passengers that the scenic spot can receive. There are three main evaluation indexes for tourists' psychological capacity, namely, tourist satisfaction, degree of congestion in scenic

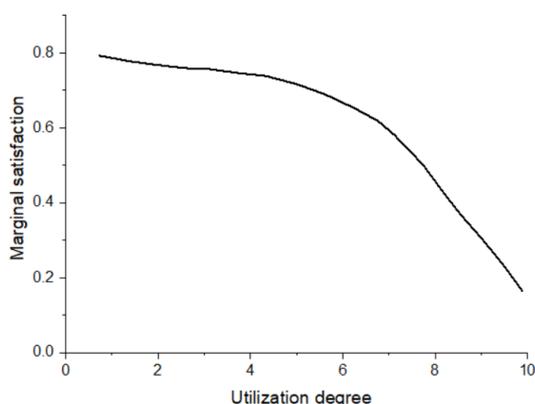
spots, and intensity of management, as shown in Figure 1.

### Measuring the evaluation indexes of tourism psychological capacity

Previously the data collection of tourism psychological capacity was usually made by means of information research, on-site observation, and questionnaire survey. The visual assessment method adopted in this paper has relatively simple operability and high reliability. It is to display the relevant photos of the scenic spot environment and the number of passengers to the tourists during their rest, then ask them to answer the questionnaires according to the on-site experience, and finally deeply analyse the statistical data.

Despite the instability of tourists' psychological capacity, the marginal effect analysis is a scientific and effective method for measuring psychological capacity indicators. The analysis curve of marginal effect shows that the more visitors, the greater the utilization of scenic resources and the lower the tourist satisfaction. When the utilization of the scenic spot reaches a certain level, the tourist will show a significant steep drop, as shown in Figure 2.

Figure 2. Marginal effect analysis curve



### Factors affecting tourist's psychological capacity

Due to the high uncertainty of tourist's psychological capacity, there are numerous influencing factors on it. In general, based on the principles of social interference and psychological expectation, the factors affecting psychological capacity are attributed to five

dimensions: tourism motivation, personal attributes, natural environment of scenic spot, humanities of scenic spot, and crowded norms, as shown in Figure 3.

Figure 3. Influencing factors of tourism Psychological capacity



### EMPIRICAL ANALYSIS BASED ON VISUAL ASSESSMENT METHOD

#### Questionnaire survey and sample situation

Taking Changzhou Chunqiu Yancheng as an example, this paper conducts empirical research on the psychological capacity of tourists in national scenic spots and also its influencing factors based on visual assessment method, questionnaire survey and mathematical statistics. Figure 4 shows the plan for the scenic spot of the Chunqiu Yancheng.

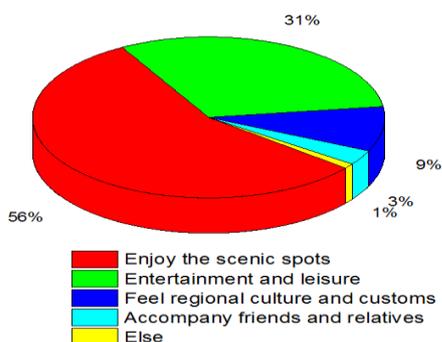
Figure 4. The plan of the scenic area of the Chunqiu Yancheng City in Changzhou



During the Spring Festival of 2019, a survey on the scenic spot was conducted. 4 groups of photos were distributed to 300 visitors for visual assessment, and number of tourists on the photos of the 4 groups was 0-20, 20-40, 40-60,

60- 80 respectively. 284 valid questionnaires were recovered. According to the demographic characteristics of samples, the males accounted for 53.6% and the females for 46.4%; in terms of the age group, respondents were mainly distributed in the age of 21-45, accounting for 49.2%. Most of the tourists had education level, middle income level, and the occupations such as students, enterprise employees, teachers, civil servants, and retired seniors, as shown in Figure 5. In terms of tourism motivation, 56% of tourists were motivated to watch scenic spots, 31% of tourists were for entertaining and leisure, 9% tourists were for regional culture and ethnic customs, and 3% of tourists were to accompany relatives and friends.

Figure 5. Statistical results of tourists' tourism motivation



**Regression analysis model**

Taking the total number of tourists in the Chunqiu Yancheng as the independent variable, and the psychological capacity of the tourists as the dependent variable, the regression analysis was performed for the on-site survey results, to fit five regression analysis models and establish the equation with the highest fitting degree (Table 1).

Table 1. Fitting degree of regression analysis model

Regression analysis model	Fit degree	F value	Significance
$y=a*x+b$	0.03	4.7	0.05
$y=a*\lnx+b$	0.42	12.2	0.01
$y=a/x+b$	0.75	10.6	0.00
$y=x^a+b$	0.24	5.7	0.02
$y=a*\exp(x)$	0.12	8.3	0.03

From the analysis of Table 1, it is found that among the five models with regression analysis above,  $y=a/x+b$  model had the highest degree of fitting, where the parameter  $a=2.53$ ,  $b =0.81$ . Also, the F-value obtained by curve fitting was 10.6, the significance was 0.00, and the fitting degree was 75%, much higher than other regression models.

Using the visual assessment method, we obtained the tourists' acceptance of different levels of crowding as shown in Figure 6.

Figure 6. Visitors' acceptance of different levels of crowding corresponding to four groups of photos

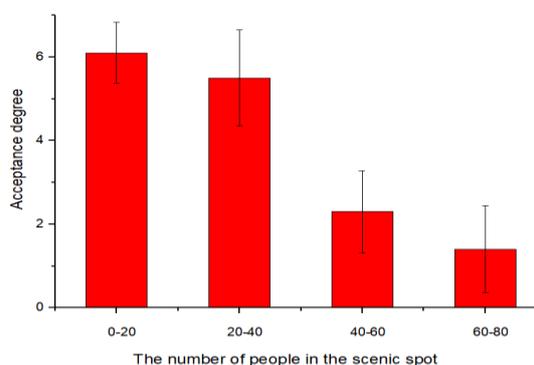


Figure 6 shows that the psychological acceptance of tourists decreases monotonically with the increase in the total number of tourists in the scenic spot. When the number of tourists in scenic spots on the assessed photo increased from 30 to 50, the tourists' perception of psychological emotions would be significantly reduced. The psychological acceptance level 4 of tourists was the warning line of scenic spot management, and it shall be unacceptable when below 4.

**FACTORS AFFECTING THE TOURISM PSYCHOLOGICAL CAPACITY**

Table 2. Correlation coefficient and P value between 4 groups of visual evaluation photos and tourism motivation

	Correlation coefficient	P value
Picture 1 (0-20)	-0.094	0.073
Picture 2 (20-40)	-0.136	0.012
Picture 3 (40-60)	-0.129	0.008
Picture 4 (60-80)	-0.135	0.015

Based on the social interference principle and the psychological expectation theory, the factors affecting the psychological capacity of tourists were attributed to five dimensions: tourism motivation, personal attributes, natural environment of the scenic spot, humanities in the scenic spot, and crowded norms. Taking the tourism motivation of tourists as an example, the correlation coefficients and P values between the four groups of visual assessment photos (0-20, 20-40, 40-60, 60-80) and tourism motivation were listed, as shown in Table 2.

It can be seen from Table 2 that the tourism motivation of the tourists has a significant influence on the correlation coefficient  $r$  of photo groups 2, 3, and 4, and then determines that the tourism motivation is a significant influence factor of the tourists' psychological capacity and emotional perception.

## CONCLUSIONS

Based on the visual assessment method, this paper takes the Changzhou Chunqiu Yancheng scenic spot as an example, and uses questionnaires and mathematical statistics to empirically analyse the psychological capacity of tourists in the national scenic spots and also its influencing factors. The conclusions are as follows:

(1) Among the five regression analysis models between the tourist's psychological capacity and the total number of tourists in the scenic spot, the  $y=a/x+b$  model enjoyed the highest degree of fitting, where the parameters  $a=2.53$  and  $b=0.81$ ; the F-value obtained by curve fitting was 10.6, the significance was 0.00, and the fitting degree was 75%, which are much higher than other regression models;

(2) The psychological acceptance of tourists decreases monotonically with the increase in the total number of tourists in the scenic spot. When the number of tourists in scenic spots on visual assessment photo increased from 30 to 50, the tourists' perception of psychological emotions would be significantly reduced. The psychological acceptance level 4 of tourists was the warning line of scenic spot management, and it shall be unacceptable when below 4;

(3) Among various influencing factors, tourism motivation is a significant factor affecting the psychological capacity of tourists.

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