ISSN 2616-5783 Vol.8, Issue 3: 44-49, DOI: 10.25236/AJHSS.2025.080307

Research on the Physiological and Emotional Regulation Mechanisms of Tourists in Ancient Village Tourism: A Case Study of Jingmai Mountain in Yunnan

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Abstract: *As an important carrier of cultural heritage manifestation, ancient villages have attracted much attention in the integration of culture and tourism, but the existing studies mostly focus on resource development and rural revitalization, and lack in-depth exploration of the mechanisms by which their authenticity affects tourists' emotions. Based on the emotional cognitive appraisal theory, the article explores the mechanism of physical and mental changes of ancient village travelers under the complex perspective, in order to reveal the deeper principles of the role behind the conservation and development of the original authenticity of ancient villages. Research findings:1) the original authenticity environment of ancient villages has a positive psychological effect on tourists, promotes relaxation and pleasure, and significantly alleviates negative emotions; 2) specific cultural environments stimulate autonomous exploration and enable tourists to actively acquire knowledge in a relaxed state.*

Keywords: *traditional villages; physical and mental health; heart rate variability; POMS scale; mood changes*

1. Introduction

With the rise of rural tourism, “ethnic traditional village style tours” have sprung up[0], and the ancient village as an important human resource in rural tourism development, contains a profound cultural history[0].Reasonable tourism development of traditional villages is not only conducive to the maintenance of rural characteristics, but also conducive to the enhancement of the cultural self-confidence of the country and the nation and the maintenance of the integrity and diversity of Chinese culture[0]. Ancient village tourism provides tourists with an opportunity to gain a deeper understanding of different living patterns by integrating the traditional lifestyle of local residents and unique local cultural values into tourism products[0], and this integration not only enhances the experiential value of the destination, but also promotes the understanding of cultural diversity and sustainable development practices[0].

The interview method and the case study method are the common methods used in the academic research on ancient village tourism, and the research subjects are mainly local farmers or community villages, which has limitations. Village tourism research focuses on economic development and employment of farmers, and ancient villages research focuses on cultural value and product development, lacks the perspective of tourists, and lacks diversification of disciplines, which makes it difficult to meet the needs of the rapidly changing society.

In this paper, we selected Wengji Ancient Village in Jingmai Mountain, Yunnan Province, as a case site, and with the help of emotional cognitive evaluation theory, we used HRV (heart rate variability) technology to monitor the physical and mental changes of the subjects in the daily life environment and the ancient village tourism environment, and through the construction of the emotional cognitive behavioral model of the ancient village tourism, we aimed to explore the impact of the ancient village tourism on the physical and mental health of the tourists from the tourists' point of view, especially from the aspect of the environment and the culture of ancient villages. Through empirical analysis, this paper will reveal how ancient village tourism can be used as a positive form of tourism to promote

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tourists' mental health and emotional experience, and then provide strategic suggestions for the sustainable development of cultural tourism as well as the development and protection of traditional villages.

2. Relevant theory and analytical framework

2.1 Cognitive evaluation theory of emotion

The cognitive appraisal theory of emotion proposes that emotion is a person's response to the relationship between objective things and personal needs[0], and that cognition, emotion and behavior have a hierarchical and progressive relationship, with external stimuli influencing individual emotion and subsequent feedback behavior through cognition and appraisal[0]. The theory of cognitive appraisal of emotion is not only widely used in the field of psychology, but also penetrates into many disciplines such as education, management, medicine, etc., promoting the development of interdisciplinary research. Based on the research of several scholars, a cognitive-evaluation theory model was constructed as Figure 1.

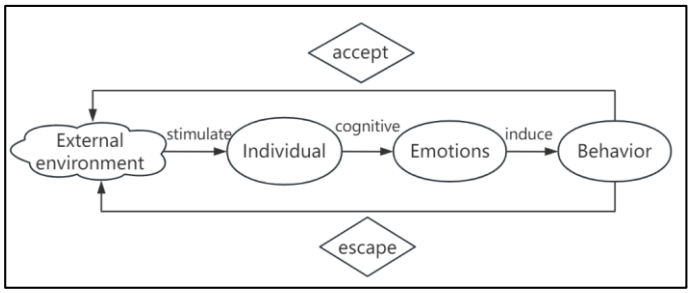

Fig.1 Cognitive-evaluation theoretical model

2.2 Build research model

In the process of visiting ancient villages, tourists are exposed to different external stimuli such as traditional architecture, cultural atmosphere, production and life style of local residents, and thus their emotions change. Based on the changes in emotions, they make corresponding behaviors to cope with the external stimuli. Based on the "cognitive-evaluation" theory, the research model of this paper is constructed as Figure 2.

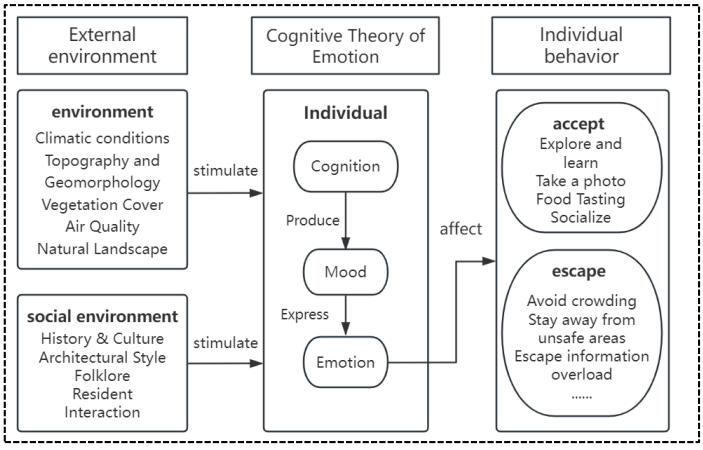

Fig.2 Cognitive behavior model of ancient village tourism emotion

3. Research samples and methods

3.1 Sample selection

3.1.1 Subject recruitment

(1)Recruitment method: This project recruited participants by Posting posters, sending leaflets,

ISSN 2616-5783 Vol.8, Issue 3: 44-49, DOI: 10.25236/AJHSS.2025.080307

wechat group push and other convenient sampling methods.

(2)Recruitment conditions: 1.tourists with high levels of recent stress or nervousness were screened as subjects through the POMS scale; 2. subjects with serious physical or mental illnesses were excluded to ensure that the results of the study were not interfered with by other health problems; 3. diversity of subjects in terms of age, gender, and occupation was ensured to enhance the generalizability of the results; 4. non-tourism industry practitioners.

(3)Number of recruits: 40.

3.1.2 Research scene

Wengji Ancient Walled Village is one of the five traditional villages of the Brown ethnic group in Jingmai Mountain, with a unique geographical location, situated in the mountainous area above 1,300 meters above sea level, surrounded by tea gardens, and relying on the mountains and the water. The ancient village is staggered along the contour around the center of the village, preserving the traditional layout and historical features of the Brown villages.

3.2 Research method

3.2.1 HRV dynamic evaluation and analysis method

The HRV dynamic tracking and evaluation technique is one of the well-established research methods in the field of psychology and neuroscience, which can directly reflect the continuous high-precision signal tracking of HRV indexes in the time and frequency domains of the subjects in dynamic situations[0]. By measuring the subjects' autonomic activity (sympathetic and parasympathetic nervous system) patterns and interactions, it can objectively assess their physiological state and avoid the limitations of verbal expression tests, thus evaluating the differences in physiological expression of subjects in different tourism scenarios[0].

3.2.2 Questionnaire survey

(1)Basic information: age, gender, physical condition, HRV data collection description, control scale;

(2)Mood State Scale: investigate the subjects' emotional state before and after the experiment.

3.3 Research process

3.3.1 Pre-intervention test (Daily life)

One week prior to the case-site test, subjects were required to go to the Tourism Management Laboratory of Kunming University for data collection on daily status, including HRV test, filling out questionnaires and scales. Subjects arrived at the laboratory on time, took a 10-minute break after filling out the questionnaire, and then maintained a quiet and relaxed posture, breathed naturally and recorded HRV data continuously.

3.3.2 Intervention Test (on-site)

Subjects will form a tour group as tourists, led by a tour guide, and travel to Wengi Ancient Village in Jingmai Mountain for nature field tests. Subjects will be tested before, during and after the traveling scenarios of the selected route. Throughout the experiment, participants will be monitored for HRV, and participants' continuous heart rate (respiratory rate, heartbeat intervals, etc.) data will be collected and analyzed by the Fitlab® system.

4. Empirical analysis

4.1 HRV parameter analysis in different scenarios

It can be seen from Table 1 that the variance analysis was used to study the differences of HRV parameters in different scenarios, among which 7 indicators such as VLF and LF showed significant differences ($p<0.05$), indicating that the HRV indexes of the subjects had significant changes in three different scenarios: daily life, arrival at wengjiGuzhai, and the end of visiting wengjiGuzhai.

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Tab.1 Comparison of HRV parameters in different scenarios

	DL	GT	ET	*F*	*p*
RRmean	763.26±105.48	737.56±88.94	714.41±93.77	1.738	0.183
SDNN	50.63±17.77	46.59±20.13	50.96±23.35	0.379	0.686
RMSSD	31.15±15.19	28.11±17.34	23.41±12.24	1.809	0.171
pNN50	11.85±13.85	10.22±14.95	4.11±4.15	3.118	0.050*
SD1	22.11±10.80	19.78±12.30	16.48±8.68	1.886	0.158
SD2	67.85±23.18	62.44±26.81	70.04±32.45	0.536	0.587
VLF	873.04±747.20	791.63±640.55	1417.70±1357.66	3.338	0.041*
LF	649.81±556.09	303.15±270.64	334.00±271.75	5.837	0.004**
HF	760.04±823.50	308.67±362.53	133.48±169.61	10.097	0.000**
LF/HF	1.57±1.74	3.17±2.84	4.02±3.74	5.013	0.009**
%LF	0.50±0.22	0.66±0.21	0.71±0.16	7.918	0.001**
%HF	0.51±0.22	0.34±0.21	0.29±0.16	8.778	0.000**
Vitality	75.62±9.83	77.93±8.95	72.33±11.43	2.081	0.132
* p<0.05 ** p<0.01, DL:Daily life situation scene;GT:Arrive at scene;ET:End of tour scene					

Figure 3 is the result of pair-to-pair comparison of the three scenes. It can be seen from Figure 3 that there are significant differences between the scene of arrival at wengji Guzhai, the scene at the end of the tour and the scene of daily life respectively, which means that Guzhai tourism can affect the physiological level of tourists to a certain extent.

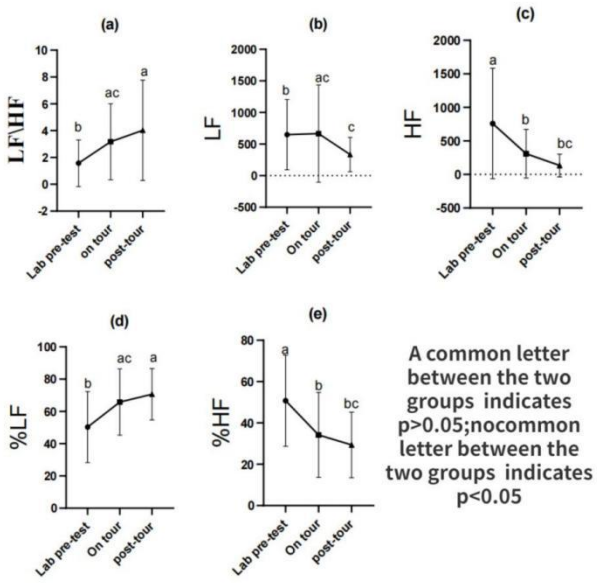

Fig.3 Significant difference after pairwise comparison of three scenes

4.2 Analysis of POMS scale in different scenarios

As can be seen from Table 2, the paired T-test analysis was used to study the differences in the emotional states of the subjects in different scenarios, among which 15 indicators such as tension, listlessness and relaxation showed significant differences ($p<0.01$). There were significant differences ($p<0.05$) in the four indexes of vitality and vigor, which indicated that the subjects' emotions had significant changes in the two different scenarios in daily life and after visiting wengji Guzhai.

Tab. 2 Changes of emotional indexes in different scenarios

name	DL	ET	difference	*t*	*p*
nervous	1.84±0.93	1.06±0.25	0.77	4.509	0.000**
listless	1.71±0.86	1.16±0.37	0.55	3.770	0.001**
cheerful	3.06±1.06	3.90±1.04	-0.84	-3.763	0.001**
frenetic	1.45±0.68	1.06±0.25	0.39	3.013	0.005**
grouchy	1.84±1.07	1.06±0.25	0.77	3.967	0.000**

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name	DL	ET	difference	*t*	*p*
fatigued	2.10±1.08	1.45±0.68	0.65	2.752	0.010**
energetic	3.10±1.01	3.90±0.98	-0.81	-3.758	0.001**
unable to concentrate	1.81±0.83	1.23±0.43	0.58	3.503	0.001**
uneasy	1.42±0.89	1.06±0.25	0.35	2.160	0.039*
exhausted	2.10±1.08	1.16±0.37	0.94	4.636	0.000**
proactively	3.26±1.03	3.61±0.99	-0.35	-1.731	0.094
flustered	1.45±0.68	1.16±0.58	0.29	1.871	0.071
restless	1.42±0.89	1.06±0.25	0.35	2.160	0.039*
worn out	2.06±1.12	1.19±0.48	0.87	4.227	0.000**
full of zest	3.13±1.26	3.87±0.99	-0.74	-3.025	0.005**
forgetfulness	2.00±0.93	1.32±0.54	0.68	3.851	0.001**
excitable	2.32±1.01	2.23±1.12	0.10	0.399	0.693
vibrant	3.03±0.95	3.55±1.06	-0.52	-2.380	0.024*
uncertainty	1.97±1.05	1.26±0.51	0.71	3.926	0.000**
worrisome	1.94±1.03	1.13±0.34	0.81	4.292	0.000**
full of vigor	3.06±1.03	3.55±1.18	-0.48	-2.182	0.037*
current state	7.48±2.20	8.39±1.56	-0.90	-2.830	0.008**
* p<0.05 ** p<0.01; DL:Scene of daily life status; ET:Scene at the end of the tour					

5. Research conclusion and discussion

5.1 Research conclusion

5.1.1 The authenticity of ancient villages has a positive psychological effect on tourists

During the tourist experience in wengjiguzhai, the positive emotions of tourists were significantly enhanced. According to the data in Table 2, we can observe that, compared with daily life, the positive emotion indicators of tourists after visiting ancient villages, such as feeling relaxed and happy, full of spirit and interest, have been significantly improved. The reason is that the traditional architecture and characteristic living environment in Wengiguzai attract tourists, making them forget their troubles for a short time and devote themselves to the traditional village scene. On the other hand, in the process of visiting, local residents actively participate in tourism activities and warmly entertain tourists. The higher the degree of residents' participation in tourism, the stronger the tourists' positive perception of tourism, which makes tourists still obtain higher emotional value after the tour.

5.1.2 Ancient village tourism plays a positive role in relieving tension

By comparing the emotional states of the participants in daily life and after the tour, it can be seen that the negative emotions are significantly reduced, which indicates that the ancient village tourism can alleviate the negative emotions of tourists to a certain extent, thus helping tourists to free themselves from the pressure of daily life. The different identities of foreign tourists and local residents affect the behavior of tourists to a certain extent. The differences in lifestyle and cognitive level between the two sides can make tourists put down their guard. In the process of communication with local residents, the simplicity of folk customs can also effectively help tourists reduce their anxiety.

5.1.3 A specific cultural environment can inspire visitors to explore new knowledge independently

Tourists showed lower levels of physiological activation during the visit to the ancient village, with LF and HF significantly lower, %LF rising, %HF significantly lower, and LF/HF significantly higher (data from Table 1), indicating that tourists were calm and relaxed. The tour process is dominated by sympathetic nerve action, worry and forgetfulness indicators decreased, and the mental state was elevated (data from Table 2). The cultural atmosphere of the ancient village provides an exploration environment for tourists, and tourists think about the historical origins through “stress-free” learning, so their moods remain relaxed.

5.2 Research inspiration

Based on the above findings and discussions, this study proposes the following inspirations on the management and control of ancient village development and protection, so as to promote the high-quality development of ancient village tourism and residents' life, and help realize cultural

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protection and rural revitalization.

(1)Strengthening the protection of the authenticity and cultural heritage of ancient villages, preserving ancient buildings, traditional customs and history and culture, providing a unique cultural atmosphere, promoting relaxation, pleasure and stimulating nostalgia among tourists, relieving daily stress, and enhancing the tourism experience, thereby promoting the sustainable development of ancient villages.

(2)Create specific scenarios to promote visitors' emotional recovery. Managers should enhance the role of ancient villages in relieving visitors' stress by providing a tranquil environment and organizing relaxing activities and experiences. In addition, visitors can be encouraged to explore the culture and history of the ancient villages in depth by setting up interactive exhibitions, providing guided tours, and carrying out cultural experience activities, thereby enhancing visitor participation and satisfaction.

(3)Motivate tourists to explore and acquire knowledge independently. Specific cultural environments motivate tourists to explore new knowledge on their own, and managers can satisfy their needs through innovative tourism products and enhance tourists' understanding and experience of the culture of ancient villages through enhanced educational functions.

5.3 Insufficient research

This study, as an interdisciplinary exploratory work, is innovative to a certain extent, but there are shortcomings: first, the complexity of the case site and the uncertainty of the subjects lead to incomplete data collection, and the follow-up needs to plan the scene, arrange the personnel, and debug the equipment in advance to ensure the data completeness; second, the study is confined to the ancient villages in Jingmai Mountain, which has a unique cultural atmosphere and mode of production and life, and the conclusions of the study are of great significance to the local area but may not be applicable to other traditional villages because of the local differences. The study may not be applicable to other traditional villages. In the future, more case studies can be selected to explore the influence of ancient villages on the change mechanism of tourists' emotions under different stages and development modes, so as to form a systematic result.

Acknowledgement

Funded by: Social Science Program of Yunnan Provincial Education Department(2025Y1101)

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