

Evaluation and Analysis of Soundscape Experience in Rural Complex

-- Taking Haotang Village in Xinyang City as an Example

Manyi Fu^{1, a}

¹College of Forestry, Xinyang Agriculture and Forestry University, Xinyang, 464000, China

^a304761473@qq.com

Abstract

With the rapid development of beautiful countryside, rural tourism has become more and more people's choice. However, the survey found that the construction consciousness of rural tourism sound is relatively weak, and the sound and landscape can not be well integrated, so they can not play the greatest role. Therefore, this paper mainly investigates the subjective evaluation of tourists on the sound and landscape in haotang village, The interaction between sound and landscape is obtained. Taking haotang village in Xinyang City as an example, this paper investigates the tourists' evaluation of the coordination degree of typical sound sources, the visual experience of landscape and the experience of functional facilities in haotang village. Through the statistical analysis of the data, it can be concluded that the coordination degree of natural sound is the highest, and that of artificial sound is the lowest; Through the correlation analysis and nonparametric test of the data, it can be concluded that the harmony between natural sound and landscape is the highest, and the better the effect of landscape visual and functional experience facilities is, the higher the requirements for natural sound will be; The score of function facility experience has the greatest influence on the score of artificial sound coordination scheduling; Tourists' age, gender, educational background and their place of residence will also have an impact on the evaluation of sound. Through the correlation analysis, it is concluded that age has the greatest correlation with the evaluation of sound coordination.

Keywords

Rural complex; Voice evaluation; Evaluation of visual landscape experience; Evaluation of functional facilities.

1. Introduction

More and more people's yearning for an idyllic life makes rural tourism become a trend. Moreover, with the support of the rural revitalization policy, the development of characteristic and high-quality rural tourism has gradually become a general trend. Under such a trend, higher requirements have been put forward for the landscape quality of rural tourism attractions. However, However, the landscape construction in rural tourist scenic spots is mainly manifested through "visual", and the sound landscape is relatively lacking [1], which is due to the lack of awareness of acoustic atmosphere. There are often voices inconsistent with the atmosphere in rural scenic spots, so the quality of the scenic spot has been reduced, and the recreation satisfaction of tourists has been greatly reduced.

Porteous and Mastin found that visual landscape is the extremely important influencing factor in the acoustic landscape evaluation process [2]. Japanese scholar Tamura found that people have different preferences for different types of sound sources. In Japanese sound source types,

natural sounds such as wind blowing leaves and water are more popular, while traffic, grass cutting and artificial sounds are not popular with [3]. In his paper, Gifford explained that the users' social behavior information and their subjective evaluation, and the research found that age, gender and status can affect the of the surrounding soundscape [4].

Kang Jian and Yang Wei proposed that the three elements of sound, listener and spatial environment constitute the acoustic scene [5]. Li Guoqi put forward the relationship between human-voice-environment through investigation and research [6]. Through investigation and data analysis, Liu Jiang obtained the interaction between sound and landscape, believing that the landscape experience will affect the coordination of sound to score [7]. Ren Xinxin believes that the visual landscape evaluation will also be improved in a better sound environment, and the sound environment and the visual landscape are closely related to the [8].

In rural tourist scenic spots, tourists not only hope that the scenic spots have a good visual landscape, but also hope that the sound and landscape can be closely coordinated, under the premise of not destroying the sound of rural nature, make the sound play its important role in the scenic spot. Therefore, the survey mainly takes sound subjective feelings as the entry point, focusing on the rural scenic spots, to the interaction between sound and landscape. Make the landscape and sound combined to form a whole, effectively improve the quality of rural tourist attractions, so that tourists can truly enjoy nature in the rural tourism.

2. Research Method

2.1. Survey Area Profile

Haotang Village, Xinyang City, is located in the southeast of Wulidian Office, Pingqiao District, Xinyang City, Henan Province. The whole village covers an area of 20.7 square kilometers. In 2013, the Ministry of Agriculture was identified as the first "beautiful countryside" for the creation of pilot villages.

Sound elements are divided into the main hierarchical elements and secondary elements according to the type of sound source body. The main hierarchical elements can be divided into natural sound, artificial sound and living sound[9]. For the sound of Haotang Village, natural sounds refer to all sounds heard in nature, such as wind, wind leaves, water, birds, etc.; artificial sound refers to artificially created equipment, facilities, such as traffic, music, broadcast sound; life sound refers to the sound of human behavior, such as, footsteps, conversation, etc [10]. In the preliminary investigation, the key analysis was conducted on the sound of the scenic spot. A total of 14 kinds of voices with typical representatives were identified and classified, so as to provide the basis for the acoustic property characteristic evaluation of the scenic spot in the follow-up questionnaire (Table 1).

Table 1. Composition of Typical Sound Source in Haotang Village

Master-level elements	Sublevel elements
Life sound	Talk, children playing, footsteps
Artificial sound	Traffic, music, bicycles, grass mowing, sweeping, construction
Natural sound	The wind, wind blowing leaves, water, birds, insects

2.2. Questionnaire Design

2.2.1 Field of Investigation

The survey scope is mainly the cultural exhibition area, leisure and entertainment area, commercial service area and sightseeing area of Haotang Village (Figure 1).

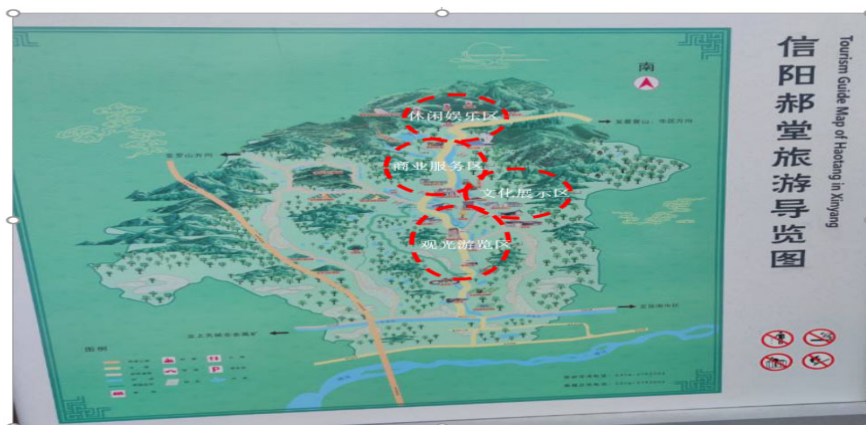


Figure 1 Haotang Village tourist attractions Zone

2.2.2 Tourist Information

Information on the social, population, and behaviouralology of visitors, including gender (male, female), age ($\leq 18, 19-75$), academic qualifications (primary school, secondary school, undergraduate, postgraduate and above), location of residence (local villager, visitor) (Figure 2).

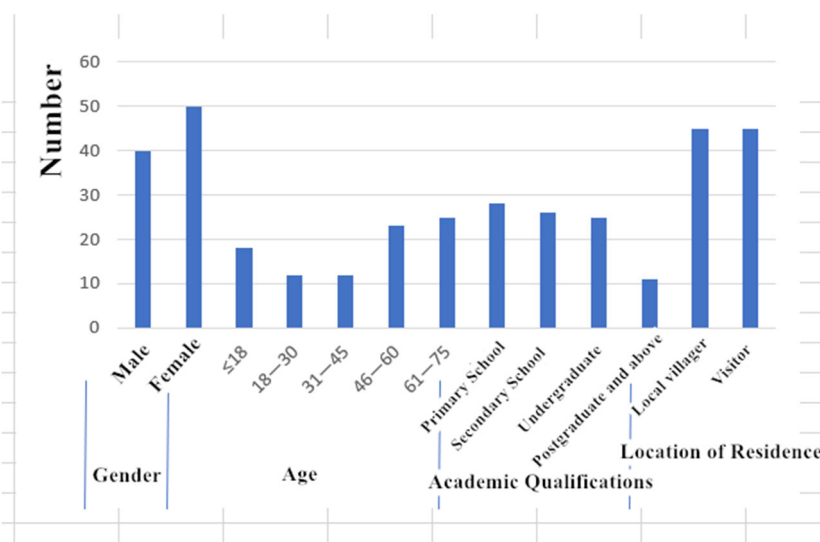


Figure 2. Tourist Social Information Statistics

2.2.3 Investigation Content

The first part is the perception frequency score of typical sound sources in Haotang Village (1: never, 2: occasionally, 3: often) good and evil degree scores (1 points: hate, 2 points: General, 3 points: like), Multiply the two scores to get coordination scores for each sound [7].

The second part is to score the landscape in the four major areas of Haotang Village. The landscape score is mainly the visual landscape experience score and the functional facilities satisfaction score. Visual landscape experience score is mainly based on the [11]; Functional facilities satisfaction score mainly scores tourists scoring rest facilities, sanitation facilities, amusement facilities, commercial service facilities, physical exercise facilities and cultural display facilities (1 points: difference, 2 points: difference, 3 points: general, 4 points: better, 5 points: good). All indicators are measured by Likter Level 5 scale method.

2.2.4 Number of Questionnaires

This survey is in the form of random interviews in the four areas divided by Haotang Village, with 25 questionnaires randomly distributed, a total of 100 questionnaires in each area.

2.3. Analytic Technique

This survey of 100 questionnaires were randomly distributed, received 90 effective questionnaires, and the questionnaire data was imported into the SPSS 26.0 for Spearman's rho correlation analysis, mainly to test whether the landscape visual experience, functional facilities experience and social behavior characteristics of tourists, and the influence of the landscape visual experience, functional facilities experience and tourist social behavior characteristics.

3. Survey Data Analysis

3.1. Sound Coordination Degree Analysis

According to Figure 3, the highest coordination score in Haotian Village is natural sound (bird sound, wind blowing leaves, wind sound and wind). The coordination evaluation of insect sound is lower than several other natural sounds, indicating that tourists do not like insect calls. Tourists also have high reviews of the sound of life (talk, children playing, footsteps coordination), with only 19% of tourists clearly saying they hate the sound. In the survey, tourists found the lowest coordination evaluation of artificial sound (construction sound, sweeping sound, grass mowing sound, bicycle sound and traffic sound). In the coordination evaluation of artificial sound, The most annoying voice for tourists is the construction sound, Think the sound of construction will seriously affect the mood of play, Therefore, the evaluation of the construction sound is very low, More than 53% in the ratio; Thirty-three percent of tourists are clearly disgusted by the traffic sound; With 51% of visitors have high or highly highly of music, Music is the highest coordinated sound in an artificial sound, Thus it can be seen that the music broadcast in the scenic area is favored by most tourists; In addition to the construction sound and the music sound, Tourists' evaluation of other kinds of artificial sound (bicycle sound, grass mowing sound and sweeping sound) is about 40% above general, It can be seen that visitors are not completely acceptable. All in all, tourists have high coordination scores on most of the voices existing in the scenic spot, from the coordination score can find that the coordination degree of tourists on natural sound, living sound, artificial sound (except music) is significantly reduced, this conclusion is also consistent with the conclusion of other scholars on sound preference [12].

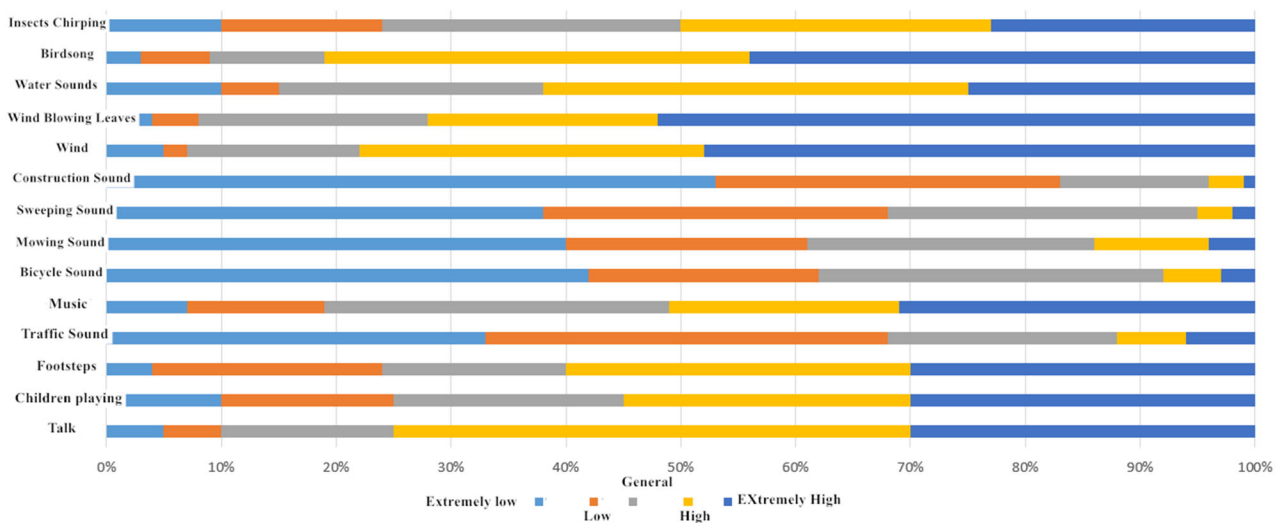


Figure 3. Evaluation of Various Typical Sound Coordination Degree

3.2. Relationship Between the Typical Sound Source and the Visual Landscape Beauty Experience

For most ambient sounds, including the bird singing, cicadas, frogs, barking, music, springs, waves, the sound of wind, and cars [13].

Using Spearman's rho correlation analysis, the relationship between visual landscape beauty experience and typical sound source coordination is analyzed (Table 2).

Available by the Table 2 correlation analysis, The visual landscape experience is associated with the sound of life (talk, playfulness for children, footsteps), artificial sound (music, bicycle, grass mowing), natural sound (wind blowing leaves, water, bird calls), Explain that the visual landscape beauty experience will affect the tourist score of the sound coordination degree in Haotang Village, Available by the correlation factors, The visual experience of the landscape affects more significantly on natural sound than on artificial sound, Coordination score of sound The coordination score of water sound is the closest to the visual landscape experience, The higher the experience, Visitors will also improve the coordination score of living voice and artificial voice.

Table 2. Correlation Analysis of Sound Coordination and Visual Landscape Experience

Typical sound source composition	Sound source coordination degree	Landscape beauty	Typical sound source composition	Sound source coordination degree	Landscape beauty
Sound of life	Talk	0.358**	Artificial sound	Sweeping Sound	0.098
	Children Playing	0.220*		Construction Sound	0.181
	Footsteps	0.201*		Wind	0.578**
	Traffic Sound	0.017		Wind Blowing Leaves	0.827**
Artificial sound	Music	0.232*	Natural sound	Water Sound	0.882**
	Bicycle Sound	0.235*		Birdsong	0.749**
	Mowing Sound	0.203*		Insects Chirping	0.002

* p<0.05 ,** p<0.01

3.3. The Relationship Between a Typical Sound Source and a Functional Satisfaction

The experience of the functional facilities is different, and the voice evaluation will be disturbed to a certain extent, which will affect the tourists ' subjective evaluation of the voice. Through the questionnaire studied the coordination evaluation of functional facility satisfaction and different sounds.

Table 3. The Correlation Analysis of Sound Coordination and Functional Facilities Satisfaction

Typical sound source composition	Sound source coordination degree	Functional Facilities satisfaction	Typical sound source composition	Sound source coordination degree	Functional Facilities satisfaction
Sound of life	Talk	0.084	Artificial sound	Sweeping Sound	0.182
	Children Playing	0.221*		Construction Sound	0.258
	Footsteps	0.132		Wind	0.294
	Traffic Sound	−0.073		Wind Blowing Leaves	0.422
Artificial sound	Music	0.281**	Natural sound	Water Sound	0.46
	Bicycle Sound	0.597*		Birdsong	0.336
	Mowing Sound	0.381		Insects Chirping	0.065

* p<0.05 ,** p<0.01

Available by Table 3, the functional facilities satisfaction is related to living sound (child noise) and artificial sound (music, bicycle sound). The functional facility satisfaction will affect the coordination evaluation of living sound and artificial sound, available by the correlation coefficient, the closest relationship between functional facility satisfaction and the artificial sound, with the least impact on the coordination score of natural sound.

3.4. The Influence of the Tourist Social Information on the Typical Sound Source of the Scenic Area

Relevant studies have found a strong correlation between social, demographic and behavioral factors and acoustic landscape evaluation [7]. The survey mainly investigates the relationship between gender, age, education, residence and coordination of typical sound sources.

Import the survey data into the SPSS26.0 for Spearman's rho correlation analysis, Determine the relationship between tourist age and sound coordination (Table 4).

Available by Table 4, Age shows a relationship with life sound (children playing), artificial sound (music, bicycle sound), age will affect the sound coordination score, the older the tourists, the sound coordination score of children playing, music will also improve; age has less impact on the coordination score of natural sound. Made by the correlation coefficient, age is the most closely related to music, children play the coordination score.

Table 4. Analysis of the Correlation between Sound Coordination and Age

Typical sound source composition	Sound source coordination degree	Age	Typical sound source composition	Sound source coordination degree	Age
Sound of life	Talk	0.221	Artificial sound	Sweeping Sound	0.106
	Children Playing	0.274**		Construction Sound	0.273
	Footsteps	0.043		Wind	0.312
Artificial sound	Traffic Sound	0.118	Natural sound	Wind Blowing Leaves	0.307
	Music	0.246**		Water Sound	0.401
	Bicycle Sound	0.028*		Birdsong	0.247
	Mowing Sound	0.266		Insects Chirping	0.074

* p<0.05 ,** p<0.01

Table 5. Correlation Analysis between Sound Coordination and Education Degree

Typical sound source composition	Sound source coordination degree	Academic qualifications	Typical sound source composition	Sound source coordination degree	Academic qualifications
Sound of life	Talk	0.129	Artificial sound	Sweeping Sound	0.136
	Children Playing	0.104		Construction Sound	0.325
	Footsteps	0.008		Wind	0.376**
Artificial sound	Traffic Sound	−0.108	Natural sound	Wind Blowing Leaves	0.387**
	Music	−0.048		Water Sound	0.389**
	Bicycle Sound	0.123		Birdsong	0.511**
	Mowing Sound	0.076		Insects Chirping	−0.037

* p<0.05 ,** p<0.01

Available in Table 5, education is related to natural sound (wind, wind leaves, water, bird sound). Moreover, the correlation coefficient can be obtained, the degree has a significant positive correlation with natural sound, and the higher the tourist degree, the higher the coordination score of natural sound.

4. Conclusion and Discussion

4.1. Discussion

Since Haotang Village is a rural tourist attraction, Visitors are are idyllic, A yearning for nature, The pursuit of a comfortable life, So, In the survey data it found, Visitors have the most significant score and perception frequency of natural sound, The coordination score is also the highest, Above the coordination score of artificial sound and living sound, In this particular scenic area design, The designers also consider the geographical location of Haotang Village, Sufficient natural water sources in Haotang Village, Clear water with fish and shrimp swim, Visitors can personally experience the fun of fishing in the scenic spot, Strong interaction between parents and children, So, The landscape visual experience has the most close relationship with water sound coordination scoring, The higher the water score, Visitors will also have relatively high ratings on the visual experience.

In different areas of Haotang Village, when the rest facilities, entertainment facilities and amusement facilities are more perfect, tourists have a high coordination between children's noise and music, and the functional facilities of tourists, whether perfect or not, will not affect the score of natural sound.

The social information of tourists will also have a certain impact on the sound evaluation in Haotang Village. Tourists of different ages will accept different voices differently. The older the tourists, they prefer children playing and music. Today, the elderly living alone is still a social problem, the older the tourists, more hope the family to be accompanied, so children play the closest relationship to age, the older the age, the higher the coordination score of children will be; the higher the tourists, the more pursuit of artistic conception, sound acceptance of nature will be higher, so in the correlation analysis, get the higher degree of the closest relationship between education and natural voice, the higher the coordination score of natural voice.

4.2. Conclusion

The survey is in xinyang village as the object, using the questionnaire, obtain tourists in the subjective analysis of typical sources, by the survey data can conclude that the tourists to natural sound (wind leaves, wind, water, birds), therefore, tourists score the highest coordination of natural sound, and most traffic, construction tourists disgust, you can conclude, in the scenic landscape design, need to add or strengthen the natural sound, for construction sound or traffic sound to effective isolation or eliminate.

From the survey data, The visual landscape experience in Haotang Village is related to the coordination evaluation of life sound, artificial sound and natural sound, Explain that the visitors in a subjective evaluation of the voice, Mainly referring to the visual experience of the surrounding environment, The visual landscape beauty experience is the most closely related to the natural sound, The higher the landscape beauty score, The higher the tourist coordination score of natural sounds, And will also increase the acceptance of artificial sound and living sound, So, In the scenic area design, The specific proportion of the natural sound should be appropriately increased, Reasonable use of life sound, Meanwhile, the same Reduce the impact of artificial sound, Strive to create a good sound landscape environment in the scenic spots.

For sweeping, traffic, bicycle, construction sound, in the process of playing the sound will inevitably be heard by tourists, also learned from the data survey, functional facilities

satisfaction and children noisy, music, bicycle sound positive relationship with natural sound is not significant, known from the correlation coefficient, the closest correlation between the function facilities satisfaction, so can improve in the design of the scenic area functional facilities experience, improve the acceptance of artificial sound, thus increasing the satisfaction of tourists.

The age and education of tourists also have a certain influence on the coordination evaluation of sound. The older the age, the higher the acceptance of music and children. The higher the acceptance of the natural sound, it is necessary to retain different kinds of voices for different groups to play an important role.

There is a correlation between sound and landscape visual experience, functional facilities satisfaction, and the social behavior information of tourists, which promote and influence each other. The existence of sound to tourist scenic spots added visual beauty and dynamic, therefore, in the new era to advocate ecological civilization, pastoral song, beautiful and livable rural planning and construction requirements, on the basis of human perception to achieve local identity, meet people's landscape perception and landscape aesthetic needs, in the scenic design and construction, on the basis of the analysis of the current situation of the scenic spot, think about the landscape need to retain what voice, need to eliminate what sound, and need to increase the sound commensurate with the environment.

But because Hao Tang Village is in a specific city, it remains to be confirmed whether the conclusions have universal significance for the rural soundscape in different areas to be reached. In addition, both landscape and acoustic experience are complex psychological cognitive processes, There are still many other factors affecting the sound scene. In the subsequent research, more evaluation indicators and comprehensively consider the influence of other factors are needed to have a deeper understanding of the sound scene and make better use of the sound scene.

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