

Research on Tourists' Perception of Scenic Byways Based on Text Big Data: Taking Grass Skyline as an Example

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Abstract: This paper analyzed high-frequency words, social semantic network and emotions of tourists based on online travelogues using ROST CM6 to study the tourists' perceptual characteristics of the Grass Skyline from the perspectives of cognition and emotion, and analyzed the relationship between tourists' perceptions and the spatial patterns of the scenic byway. It is found that the high-frequency words show a “core—sub-core—periphery” structure, and tourists' cognitive evaluation can be divided into three dimensions: tourist attraction, tourist supporting facilities, public environment and services. The paper also shows that tourists to the Grass Skyline are mainly positive and neutral emotions and there are differences in tourists' emotions at different locations and sections, with a great proportion of positive emotions than negative emotions. The purpose of this research is to provide references for the construction and management of the scenic byway.

1 INTRODUCTION

Scenic byways are landscape roads that possess aesthetic, natural, tourism, cultural, historical, and archaeological values along the roadside or in the visual field, combining transportation and tourism functions (Eby and Molnar 2002, Yu et al. 2006). From the perspective of experience, scenic byways are not only tourism transit places or tourism channels in the tourism system, but also linear experience spaces. The scenic byways carrying tourism flow only by transportation function are transformed into direct tourism destinations (Zhang et al. 2020). The Grass Skyline is not only a tourist transit place but also a linear tourist destination.


The studies related to tourism perception mainly focus on the conceptual definition of tourists' perception, the influencing factors of tourists' perception, and the evaluation of the effects brought by tourism projects on tourists' perception. With in-depth research on tourism experience and tourists' perception, some scholars began to study the relationship between spatio-temporal behavior and tourists' emotions. But there are relatively few studies that combine tourists' perceptions with spatio-temporal characteristics of scenic byways.

The study tries to answer three questions: what kind of image does the Grass Skyline have in tourists' minds? What are the characteristics of tourists' perceptions of the Grass Skyline? What are the relationships between tourists' perceptions and the spatial changes of the scenic byway? To answer the above questions, this study adopts content analysis to analyze travelogues and uses ROST CM6 to study tourists' perceptual characteristics of the Grass Skyline. The study also attempts to analyze the spatial changes of tourists' emotions and analyze the reasons for the pattern, to provide suggestions for the management of the Grass Skyline.

2 METHODOLOGY

2.1 Study Area

The Grass Skyline is located in Zhangjiakou City, Hebei Province. The Grass Skyline was completed in August 2019, from Gu Yuan County in the east to Shangyi County in the west. The Grass Skyline includes Zhangbei Grass Skyline and Guyuan Grass Skyline. Zhangbei Grass Skyline was opened to traffic in 2012, and there are many tourism resources

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distributed along the route, such as the ancient Great Wall site, Huapi Ridge, etc. Guyuan Grass Skyline is opened to traffic in 2019, starting from Pingdingbao town, and ending at Zhangbei County.

2.2 Methods

The study adopts content analysis and uses ROST CM6 to analyze high-frequency words and affective analysis of online travelogues, to study the characteristics of tourists' perceptions of the Grass Skyline from the perspective of cognition and emotion, and to explore the patterns between tourists' perceptions and spatial changes of the scenic byway.

2.3 Data Collection

The study selected travelogues related to Grass Skyline in Mafengwo and Ctrip website. The principles for selecting the travelogues are as follows: firstly, the travelogues have complete information and a detailed description of the emotional expression of the travel activities. Secondly, those with obvious traces of copying are excluded. Consequently, 175 travelogues published from January 2020 to November 2021 were identified as the study sample, with a total word count of 308,879.

2.4 Data Treatment and Analyses

The word separation function in ROST CM6 was used to separate the 175 travelogues, and word

frequency analysis was performed. 100 high-frequency words related to the topic were selected according to word frequency and were categorized.

This paper studies the differences in tourists' perceptions at different locations. The sentiment analysis of ROST CM6 was conducted, and the distributions of positive, negative, and neutral sentiments were obtained. Then the study returned to the travelogues to count the number of sentiments in each scenic spot/section. It should be noted that the study mainly focuses on the positive and negative emotions of tourists because neutral emotions are difficult to define. Therefore, a graph of the fluctuation of tourists' emotional tendencies was drawn to analyze the spatial characteristics of tourists' perception of the Grass Skyline from the perspective of emotions.

3 RESULTS

3.1 High-Frequency Word Analysis

3.1.1 Word Frequency Analysis Results

100 high-frequency words related to the topic were selected from the highest to the lowest word frequency, as can be seen from Table 1, the high-frequency words are mainly composed of nouns and adjectives. High-frequency words such as “Grasslands”, and “High speed” reflect the tourists' deep perceptions of the Grass Skyline.

Table 1: Top 100 high-frequency words in the travelogues of Grass Skyline.

High-Frequency Words	Words Frequency	High-Frequency Words	Words Frequency	High-Frequency Words	Words Frequency	High-Frequency Words	Words Frequency
Grass Skyline	1906	Route	127	Evening party	70	Weekend	52
Grasslands	741	Trip	125	Breakfast	69	Sea of flowers	52
Huapi Ridge	463	highway	123	Boss	67	Wildflower	52
Wildfox ridge	395	Chongli	121	Ticket	66	Ulan	52
Zhangbei	391	Windmill	117	Camping	66	Road signs	51
Kilometre	351	Horseback riding	111	Potato	64	Green	51
Hotel	299	Beautiful scenery	104	Dine	64	Clean	51
High speed	272	Play	104	Country	63	Full range	50
Entrance	257	Viewing platform	96	far away	63	China	50
Scenery	201	Terrace	95	Camelot	63	Featured	50
View	201	Friend	94	Roads	60	Lightning lake	49
Scenic spot	193	Curbside	92	Middle	58	Manor	49
Attraction	192	Rest	92	Park	58	Sight	49
East route	177	Child	88	Forest	58	Holiday	49
Hour	176	White cloud	87	Experience	56	Roast lamb	49

Drive	161	Bonfire	86	Direction	56	Vehicle	48
Road	156	Along the way	82	Nature	56	Summer	48
Navigation	156	Travel	82	Room	56	Landscape	48
Accommodation	153	Blue sky	80	Appreciation	54	winding	48
Guyuan	142	Weather	80	The most beautiful	54	Service area	47
Zhangjiakou	140	Traffic jam	79	National highway	54	Best	47
West route	140	Beautiful	78	Swan Lake	54	Seven colors	47
Self-drive	138	Parking	78	Distance	54	Wind Power	46
Farmhouse	135	Check-in	73	Epidemic	53	Performances	46
Dam	127	Exit	70	Taste	52	Circle line	46

3.1.2 Semantic Network Analysis Results

The semantic network diagram of the Grass Skyline travelogues was obtained by using Net Draw (Figure 1). The structure shows a three-circle structure of “core—sub-core—periphery”. Firstly, “Grass Skyline”, “Grassland” and “Wildfox ridge” constitute the core image of Grass Skyline. Secondly, “High speed” and “Highway” show the direct tourists’ perception, and the Grass Skyline has been attracting tourists with its charming natural landscape. Third and lastly, “Blue sky”, “Farmhouse”, and “Bonfire” from the outer circle, suggest that these also represent the characteristics of tourists’ perception.

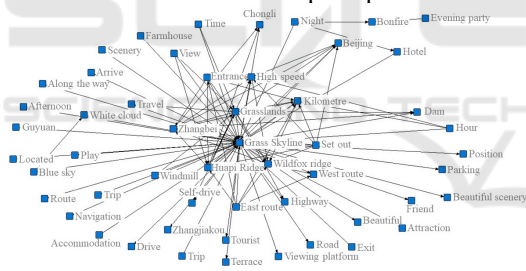


Figure 1: The semantic network structure.

According to the previous study(Zhong 2015, Yan et al. 2021), the study divided the feature words derived into three categories. The First is tourism attraction represented by grassland and viewing platform, etc. Secondly, tourism supporting facilities with accommodation and highway as representative words. Thirdly, public environment and services with weather and navigation as representative words. As a whole, figure 1 shows the most profound features of tourists’ perception, which can be summarized as tourism and transportation on the scenic byway.

3.2 Tourists’ Perception Analysis Results

3.2.1 Cognitive Appraisal Analysis Results

Combining the semantic network structure and the relevant study(Zhong 2015), the study divides tourists' cognitive dimensions of the Grass Skyline from three perspectives: tourism attraction, tourism supporting facilities, and public environment and services (Table 2).

Table 2: Tourists' cognition appraisal of Grass Skyline.

Cognitive dimensions	Specific entries	Examples of high-frequency words (frequency)
Tourism attraction	Natural Resources	Grassland(741), Huapi Ridge (463), Wildfox Ridge(395), Guyuan(142), Terrace(95)
	Human Resources	Windmill(117)、 Viewing platform(96)、 Park(58)、 Manor(49)
	Tourism Activities	Drive(138), Horseback riding(111), Camping(66)
Tourism Supporting Facilities	Transportation	Grass Skyline(1906), High speed(272), East route(177), Self-drive(161), West route(140)
	Accommodation	Hotel(299), Accommodation(153), Farmhouse(135), Evening party(70)
Public Environment and Services	Public Environment	Scenery(201), Scenic spot(193), Dam(127), Weather(80)
	Public Services	On the road(156), Navigation(156), Trip(125), Boss(67)

Tourism attraction includes natural resources, human resources, tourism activities, etc. Grass Skyline gathers a variety of natural landscapes such as grasslands, forests, and lakes, and also has various types of human landscapes such as windmills and parks, etc. The “Huapi ridge” and “Wildfox ridge” as the iconic landscape of the Grass Skyline, so tourists have a strong psychological identity. “Camping” and “Tenting” are high-frequency words related to tourism activities, which provide tourists with a variety of choices.

Tourism supporting facilities include transportation and accommodation. “High speed” and “Self-drive” indicate that tourists mainly choose self-driving tours to travel the Grass Skyline. And “Hotel” and “Farmhouse” can reflect the tourists' cognitive appraisal of accommodation and catering.

Public environment and services involve public environment and public services. Tourists' perceptions are mainly reflected in the landscape, weather, climate, itinerary, etc.

3.2.2 Emotional Tendency Analysis Results

The study obtained the tourists' emotional tendency (Table 3). The positive emotions are mainly the praise of the environment of the scenic byway, such as the words “Beautiful” and “Appreciation”. Neutral emotions are words related to the expression

of geographical information, such as “Chongli”. Negative emotions account for a small proportion.

Table 3 shows that tourists' emotional evaluation is mainly positive and neutral. Positive and neutral emotions of visitors accounted for 54.86% and 31.59% respectively. The percentage of negative emotions of visitors to the Grass Skyline reached 13.54%.

Table 3: Tourists' Sentiment Analysis.

Category	Proportion	Strength	Proportion
Positive Emotions	54.86%	General (0 ~ 10)	26.57%
		Moderate (10 ~ 20)	14.75%
		Height (above 20)	13.54%
Neutral Emotions	31.59%	/	/
Negative Emotions	13.54%	General (-10 ~ 0)	10.57%
		Moderate (-20 ~ -10)	1.77%
		Height (below -20)	0.51%

A graph of the fluctuation of tourists' emotional tendency was drawn (Figure 2). Figure 2 shows that the positive emotions of tourists during the Grass Skyline tour were higher than the negative emotions.

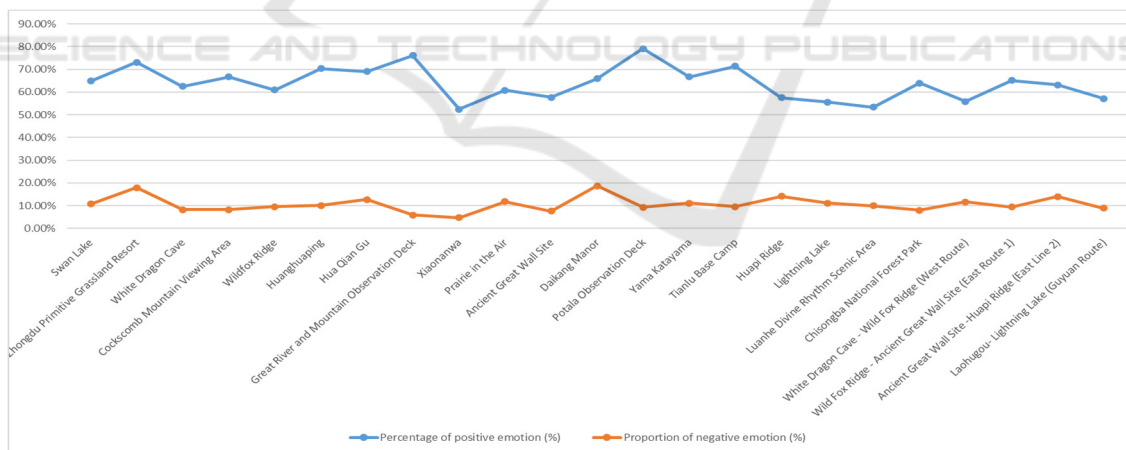


Figure 2: The tourists' emotional tendency in scenic spots/road sections.

The positive emotion of tourists is divided into two levels: $50\% < Q < 65\%$ and $65\% \leq Q < 80\%$. The scenic spots/road sections within the second level can be called the peak experience points/sections. The peak experience sites are richer in resources and relatively well supplied with products and activities, which can bring diverse tourism perceptions and attractions to visitors. Only East Route 1 belongs to

the peak experience section, and the positive visitor sentiment of this section is only 65.14%. Tourists gained a better perception in this section, mainly because most of them followed the recommended route of the Grass Skyline, entering from the west entrance. Entering the Grass Skyline from Wildfox Ridge was better perceived by tourists, and tourists' sense of novelty was satisfied.

Negative emotions arise mainly in Zhongdu Primitive Grassland Resort, Huaqian Valley, Dakang Manor, East Route 2. There are several main reasons. The first is traffic congestion. Most of the tourists are following the route initially recommended by the Grass Skyline for touring. It leads to congestion, and traffic jams directly make tourists have negative emotions. Secondly, the quality of food and accommodation can directly affect the perceived characteristics of tourists. Thirdly, weather conditions affect the quality of tourists' perceptions. Fourthly, tourists usually start from Wildfox Ridge to tour the Grass Skyline. And it leads to tourists' visual fatigue in East Route 2.

4 CONCLUSIONS

The perceptual characteristics of tourists' perceptions of the Grass Skyline are studied from the perspective of cognition and emotion, and the pattern between tourists' perceptions and spatial characteristics of the scenic byway is analyzed. The study drew the following conclusions:

The tourist perception shows diversified characteristics, and the characteristic is in a “core-sub-core-periphery” structure, with “Grass Skyline” as the core extending outward. Tourists' perceptions can be divided into three categories: tourism attractions represented by terraces, tourism supporting facilities represented by high speed, and public environment and services represented by navigation.

Tourists' emotional evaluation of the Grass Skyline is mainly positive and neutral. It was found that the percentage of tourists' positive emotions was higher than the percentage of negative emotions. In addition, the tourists' positive emotions were divided into two levels. Tourists generated strong positive emotions, that is due to the richness of resources, sufficient supply of the activities. The reasons for negative emotions were traffic congestion, poor quality of food and accommodation, bad weather conditions, and tourists' visual fatigue.

The Grass Skyline needs to be constructed and managed according to the local conditions of the scenic byway. Firstly, the Grass Skyline needs to introduce different tourist routes that meet tourists' differentiated needs. Secondly, Grass Skyline can use the resource to create diversified products and activities, while improving the quality of tourism services, to better solve the problem of tourist dining and accommodation.

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