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Tourism Experience in High-altitude Hypoxia Environment --- Based on 182 Questionnaires and Interviews of Tibet

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Abstract **Original Research Article**

Tibet is a mysterious, attractive and unique place for most Chinese, especially for the cycling enthusiasts. Riding Tibet spends 30 days while staying in Lhasa usually no more than a week, which is the negation of the principle of the travel-time ratio in tourism decision-making. In this paper, DEM digital elevation model is used to make the relief amplitude map of the southern Sichuan-Tibet line to analyze the geographical environment background of the cycling line, and reveals the most difficult and dangerous road section. Further, on the basis of 182 survey samples, finds the key factor for cyclists making such decision and overcoming the difficulties during the journey, i. e. the motivation and preparation play critical roles in the journey.

Key word : cyclists; digital elevation model; questionnaire interviews; travel experience; Tibet.

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1. INTRODUCTION

According to Professor Nelson H .H. Graburn's "Tourism Ritual Theory ", it is better to understand tourism as a ritual and special ceremony which integrates leisure and travel, and in sharp contrast to daily home life and work (Nelson, 2001). Rite originates from religion, while tourism comes from secularism. Comparing tourism and rite is a unique perspective provided by tourism anthropology for understanding the essence of tourism experience (Zhao, 2007). Tourism is a ritual expression from the individual or society, embedded in values related to health, freedom, nature, and self-improvement, and becoming a "re-creation" ritual comparable to pilgrimage and other more traditional and religious social rituals (Nelson, 1983). Collins (2009) put forward the theory of "interactive ritual chain ", which holds that all people's interactive behaviors take place in a certain situation, and the interactive ritual in the situation is bound to be a process with causality and feedback cycle (Xie & Xu, 2016).

In the course of tourists' situational experience, the interactive between visitors and environment away is sometimes presented in the form of a certain ceremony, and becomes an important factor to gather and release emotional energy. Tourism rituals emphasize the relationship and interaction between people and the environment, highlight people's emotional will and personality, and focus on the study of people's behavior and psychology in the specific situations wherein behavior occurring (Xie, 2005). However, there is a strong contrast between the secular life and the sacred existence of tourism, that is, the travel process is all-encompassing, from light mood, beautiful scenery, amorous feelings to cultural shock, all of which enable tourists to get rid of the trivial, monotonous, tedious, tension and pressure of the secular life (Zhao, 2007). Moreover, tourists are also likely to re-create themselves in this "sacred" process, and reintegrate with the "old society" in the identity of "new self" after the end of the tour (Zhang, 2003).

Cyclists entering Tibet often have to break away from the familiar habitual environment and enter a tourism world with different living customs, climatic environment and cultural atmosphere. At the same time, they have to face external environmental problems such as "altitude sickness" and "debris flow", hoping to challenge and prove themselves through such difficulty (Zhou, Yang & Liu, 2014). What is perhaps the most valuable is what they learn about themselves and regained control of their life. Taking the college students as an example, they regard cycling from Sichuan to Tibet as a "ceremony" for the transformation of their life stage, and hope to prove themselves through

the special tourism way during the transformation from "university" to "work", cherish the cycling experience as a symbol of "youth".

In the 1960s, with the development of modern tourism, bicycle began to be endowed with the meaning of sports, and bicycle tourism began to rise, as a kind of tourism mode that is not only conducive to tourists' sightseeing, physical exercise, but also enable them to experience their life (Juhn & Yang, 2009; Souffriau, Vansteenwegen & Berghe, *et al*., 2011). Many countries in the United States and Europe, bicycle tourism accounts for 5% to 10% of the total tourism market, and with many regions using bike tourism as a local pillar industry (Yan, 2016). Although the transport function of bicycle has been weakened after entering the automobile era, but with the awakening of environmental protection consciousness, bicycle has been widely promoted as an environmentally friendly and energy-saving mode of transportation (Alvarez-Valdes, Belenguer & Benavent E, *et al*., 2016; Nikitas, 2019; Audikana, Ravalet, Baranger & Kaufmann, 2017), and the Netherlands even takes bicycle as the business card of the country.

Owing to its low cost, flexible way, space saving, environmental protection, fitness, willpower, challenge oneself and many other fashion functions different from traditional sightseeing, vacation tourism, bicycle tourism has been favored by people all over the world (Si, Shi & Wu, *et al*., 2019; Thomopoulos & Nikitas, 2019). China domestic bicycle tourism started in the early 1980s, which was an early practice in special tourism (Wan & Meng, 2009). At present, there are four relatively well-known bicycle tour routes including cycling around Taiwan Island (Yi, 2013), cycling around Hainan Island (Sanya Daily, 2015), cycling around Qinghai Lake (Xiang, 2015) and cycling into Tibet (Zhou, Yang & Liu, 2014; Yu, 2016; Guo, 2015). In November 2011, "China National Tourism" magazine launched the top 10 domestic cycling routes, and Sichuan-Tibet Route was selected as the most beautiful route into Tibet (Xie, 2006).

Accordingly, cycling Sichuan-Tibet Line is regarded as an essential life experience of bicycle lovers, to try and challenge the different life, has become a social phenomenon and young people scramble to imitate a behavior. However, it takes about 20-30 days to ride from Sichuan to Tibet, while staying in destination Lhasa usually no more than a week, which is the negation of the fundamental of the travel-time ratio in tourism decision-making (Xie, 2005). What kind of motivation and experience enables tourists to overcome the difficulties during the journey? Some scholars believe that Tibet's mysterious and unique natural scenery, religious atmosphere and social culture make it a wonderful place for tourists to create unforgettable memories of their sacred journey (Zhong & Zhang, 2012). However, different ways of entering Tibet have different influences on tourists' travel experience in Tibet. And the travel experience and pleasure obtained by cycling tourists are far greater than that of other means of transportation, which may also be an important reason why many cycling tourists are keen on this activity (Su, 2010).

Many scholars have begun to focus on the study of bicycle tourism. Yu has made a comprehensive study on cycling practice from the aspects of pre-cycling preparation, cycling equipment, cycling planning, cycling difficulty and so on (Yu, 2016). Guo did a behavioral study on cycling in Tibet (Guo, 2015). Zhou have done the analysis of cycling motivation and tourism experience from Sichuan to Tibet (Zhou, 2014). Hu, Li and *et al*. analyzed their cycling experience of scenic route cycling based on the content of travel notes on 318 National Road (Hu, Li & Luo, 2015). However, it takes about 20-30 days to ride from Sichuan to Tibet, while staying in destination Lhasa usually no more than a week, which is the negation of the principle of the travel-time ratio in tourism decision-making. Obviously, the behavior of cyclists cycling into Tibet offends against common sense and rationality. What kind of motivations of tourists and charm of Tibet attract them to make such decision and overcome the difficulties during the journey? What's more, the psychological disturbance and emotional experience caused by the complicated geographical environment have not been effectively answered.

Therefore, in the view of the interactive feedback of tourism motivation and environmental difficulties of travel into Tibet, this study makes a complete and systematic field investigation and interview on the 2150 km journey of the southern Sichuan-Tibet Line. And DEM digital elevation model is used to make the relief amplitude map of the southern Sichuan-Tibet line to analyze the geographical environment background of the cycling line, and reveals the most difficult and dangerous road section. Further, on the basis of 182 survey samples, analyzes the characteristics of emotional experience of Tibetan cyclists, so as to remind and help enhance their tourism experience.

2. METHODS

2.1 Digital elevation model

Combined with the specific terrain, mileage, elevation and other data on the South Sichuan-Tibet Line of 318 National Road part, referring to previous research methods (Zhou, Li & Reng, 2012), based on the DEM method, the following formula is used to calculate the terrain fluctuation:

$$RDLS=ALT/1000+ \{[Max(H)-Min(H)]\times[1-P(A)/A]\} /500$$

Here, RDLS is on behalf of topographic relief amplitude. ALT is the average altitude (m) in a certain

area centered on a given grid cell, while Max (H) and Min (H) are the highest and lowest altitude (m) in this region, respectively. A is the total area of this region, and P (A) is the area of flat ground within this region (km^2). In this study, the area with altitude difference less than 30° in the same unit is identified as flat ground. The cycling mileage and altitude data in this paper were obtained from the field investigation of the border pillar of National Highway 318, record of the traveler App and AMAP.

2.2 Questionnaire

From June 30 to July 23, 2019, the author rode 2150 km from Chengdu to Lhasa City along the south Sichuan-Tibet Line of 318 National Road. And in-depth interviews, participatory observation and questionnaire were used for first-hand data collection during this period. In addition, the geographical data (altitude, mileage, climbing rate, descending rate, etc.) were also investigated in order to understand the actual situation of the Sichuan-Tibet Cycling Line part on the National Highway 318. In the whole process, the author and other cyclist eat and live together, and get along with each other as a traveling companion. During the study, the researcher took the initiative to identify himself to the interviewee and conducted interviews with their consent. Besides, author wrote daily travel journal to record daily interviews and observations, cyclist behavior, conversations, and his personal feelings.

The investigation focuses on the cyclists' travel motivations and how to cope with difficulties, and several QQ groups of cyclists for cycling into Tibet were added selectively, and the cycling companion were interviewed and returned with questionnaires after the trip. During this period, 20 cyclists were interviewed, including students, workers and retirees who aged between 18 and 60, lasting from 15 to 20 minutes. 200 samples were collected based on snowball sampling, among which 182 were valid, with an effective rate of 91%. In the valid questionnaire, male respondents accounting for 55%, which is in line with the strict requirements to superb physical qualities because of complex cycling conditions. In terms of occupational characteristics, 65% of cyclists were college students, possibly because it happened to be summer vacation. As far as education level was concerned, more than 80% have college degree and above, while the least educated cyclists graduated from junior middle school.

3. Difficulty Analysis of geographical environment for cycling into Tibet

3.1. Background analysis of geographical environment

Since ancient times, the link of economic and cultural of all ethnic groups in southwest China is the world's highest and most dangerous post road (used called Ancient Tea Route), which runs across the high mountains on the Hengduan Mountain and the Tibetan Plateau area. Nowadays, we call this improved road ‘Sichuan-Tibet Line’, southern part of National Highway 318, the first highway that connects Chengdu in Sichuan province and Lhasa in Tibet. And it across China's terrain stair of 1 and 2, with a lowest altitude of 512 meters (downtown Chengdu) and a highest altitude of 5,130 meters (Dongda Mountain Pass). From the east to the west, it turns over Erlang Mountain, Fenduo Mountain, Golsi Mountain, Shearzi Bay Mountain, Kazira Mountain, Haizi Mountain, Zongbala Mountain, Lawu Mountain, Chaba Mountain, Dongda Mountain, Yera Mountain, Andura Mountain, Sera Mountain, Mira Mountain and other 14 steep mountains, most of their elevation above 4000 meters, among which Dongda Mountain and Mira Mountain elevation over 5000 meters, see Figure 1.

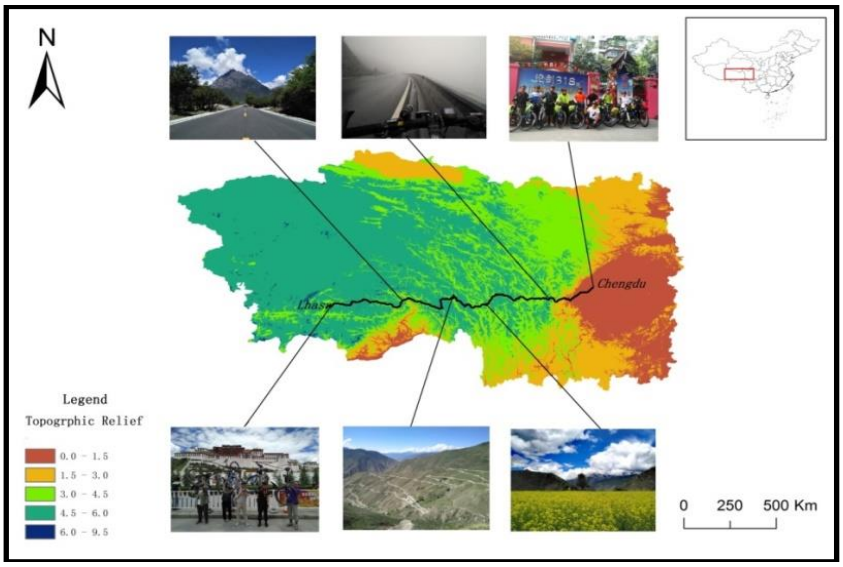

Fig-1: Topographic relief amplitude of southern Sichuan-Tibet route on the National Highway 318

Here, the topographic relief amplitude of the study area is divided into five ranges: dark red (0.0-1.5), yellow (1.5-3.0), light green (3.0-4.5), cyan (4.5-6.0) and blue (6.0-9.5), see Fig 1. It can be seen that the topographic relief of cycling route in China's terrain stair of 2 including Chengdu Plain and northwest Yunnan, is lower than 3.0. Contrarily, within the Qinghai-Tibet Plateau region, the topographic relief is very high, most of them are in the range of 4.5-6.0, and even some areas are above 6.0. The black line is the Section of National Highway 318 from Chengdu to Lhasa, and the red circle shows the counties and cities which passes through. From Chengdu to Ya 'an, the topographic relief in the deep red section has not changed significantly, indicating that the terrain is flat, the road is relatively gentle. However, from Ya'an City to Linzhi City, the topography relief of route changes frequently and drastically, which run over many mountains and canyons. In the last section, from Linzhi city to Lhasa city, the topographic relief is mainly within the range of 4.5-6.0. Although the altitude is very high, but there is no great fluctuation and not crossing many mountains.

As well known, altitude is negatively correlated with oxygen concentration, but the reduction of oxygen concentration in the air will have a serious impact on human life activities (Wu, 2006), see in Table 1. Normally, 20.9% is normal oxygen concentration, and when oxygen concentration is in 15~19%, work ability will be reduced and feel laborious, which can lead to head, lung and circulatory system problems. Once oxygen concentration decreased to 10-12%, people will feel shortness of breath, loss of judgment, purple lips. The Southern Sichuan-Tibet Line part of the National Highway 318 is about 2150 km. During the journey, we interviewed and inquired the cycling companion. According to their own situation, the actual completion days were different, and most of them completed the challenge between 20 and 25 days. Generally, when altitude above 2000 meters above sea level, the human body began to appear hypoxia reaction, and when the altitude over 3000 meters, the oxygen curve of the human body begins to steep, hypoxia becomes obvious. Once the altitude is above 4500 meters, where atmospheric pressure is less than half that of sea level, significant hypoxemia will occur in the human body and trigger a range of physiological responses.

Table-1: The relationship between Altitude and oxygen concentration

Altitude(m)	**0**	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**	**4000**	**4500**	**5000**	**5500**
Oxygen content (%)	20.8	18.5	17.4	16.3	15.3	14.4	13.5	12.7	11.8	11.1	10.4

According to the specific values of the 14 high mountains on the southern Sichuan-Tibet line including the highest altitude, rising slope path (the distance from the gentle to the highest altitude), falling slope path (the distance from the highest altitude to the gentle), climbing altitude and descending altitude, the climbing rate and the descending rate are calculated, as shown in Table 2. Obviously, due to many high mountains where the elevation of road is 4,000 meters or even more than 5,000 meters, which made the biggest challenge for cyclists is the high altitude hypoxia environment. What's more, cyclists often have more than 10 kg of luggage, and they have to climb over 14 mountains with an average altitude of more than 4000 meters in the whole journey. It is not only to overcome long-distance climbing, but also to face the low-oxygen plateau environment, poor road conditions and so on, so the difficulty of cycling is self-evident.

Table-2: Basic condition of 14 huge mountains roads in the Sichuan-Tibet Southern Route

Mountain	**Cycling Course**	**Highest altitude**	**rising slope path**	**falling slope path**	**climbing altitude**	**descending altitude**	**Climbing rate (%)**	**Descending rate (%)**	**Calendar (day)**
Erlang Mountain	Xingou - Luding	2170	16	35	840	840	5.25	2.4	2
Zheduo Mountain	**Kangding - Xindu Bridge**	**4298**	**33**	**33**	**1903**	**768**	**5.77**	**2.33**	**5**
Gaoersi Mountain	**Xindu Bridge - Yajiang**	**3934**	**17**	**42**	**475**	**2404**	**2.79**	**5.72**	**6**
Jianziwan Mountain	Yajiang - Kangbahan Village	4233	32	15	1703	100	5.32	0.67	7
Kazila Mountain	Kangbahan Village - Honglong Township	4429	21	28	846	816	4.03	2.91	7
Haizi Mountain	foot of Haizi Mountain - Batang	4685	10	80	374	2105	3.74	2.63	9

Zongba Mountain	**Jiaseding Village - Mangkang**	**4150**	**9**	**6**	**556**	**275**	**6.18**	**4.58**	**10**
Lawu Mountain	Mangkang - Lantsang Bridge	4376	9	36	501	1736	5.57	4.82	11
Jueba Mountain	Lantsang Bridge - Dengba Village	3911	27	12	1271	446	4.71	3.71	12
Dongda Mountain	**Denba Village - Zuogong**	**5130**	**37**	**36**	**1665**	**1353**	**4.50**	**3.76**	**13**
Yela Mountain	Bangda Town - Lagan Township	4658	15	40	538	1918	3.59	4.80	15
Anjiula Mountain	Basu – Ranwu	4475	70	19	1195	515	1.71	2.71	16
Sejila Mountain	**Dongjiu Township - Linzhi**	**4720**	**53**	**32**	**2160**	**1710**	**4.08**	**5.34**	**19**

As an extremely important highway running through east and west of China, the National Highway 318 runs from Shanghai People's Square to Tibet Friendship Bridge, which is more than 5000 kilometers in length. Because of the great difficulty of construction, there is no rigid slope requirement when building, but according to the requirement of the design specification for highway alignment (Ministry of Transport of PRC, 2006), the maximum longitudinal slope degree is related to the speed, i.e. 120km/h /3%, 100km/h /4%, 80km/h /5%, 40km/h /7% and 30km/h /8%, respectively. The speed of most sections of the South Sichuan-Tibet Line limits 40km/h, and even some dangerous downhill sections require speed limit below 30 km/h. The climbing rate and descending rate in Table 3 are the average values, among which the average climbing slope of Zongba Mountain is the largest, reaching 6.18%, and the descending slope of Gaoersi Mountain is the largest, reaching 5.72%.

However, in order to reduce the difficulty of driving a car, the slope of scenic mountain roads at the corner will climb sharply reach a quite high gradient, which is much higher than the average, so cycling uphill when turning is very arduous, as well as when cycling downhill on a corner. There were 14 mountains on the southern Sichuan-Tibet line of National Highway 318 from west to east, among them, the ascending slope and descending slope above 5% including Erlang Mountain, Zheduo Mountain, Gaoersi Mountain, Jianziwan Mountain, Zongba Mountain, Lawu Mountain and Sejila Mountain. On the whole, the most difficult cycling line include Zheduo mountain, Dongda Mountain and Sejila Mountain, all of which have the characteristics of high altitude, long slope, steep gradient and so on.

3.2 Difficulty Analysis of Daily Cycling

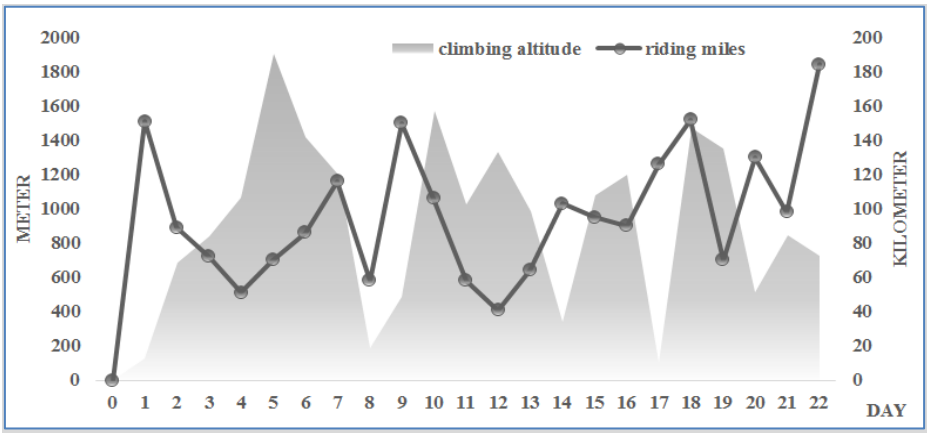

Fig-2: The daily situation for a 22-day cycling on the southern Sichuan-Tibet Line

The actual daily climbing altitude and riding miles is shown in Figure 2. It is obvious that the difficulty of cycling is positively correlated with the daily cycling mileage and climbing altitude. According to range of altitude, we classed the cycling difficulty factor of 100-300 meters, 300-500 meters, 500-1000 meters, 1000-

1500 meters and 1500-2000 meters, as 0.2, 0.4, 0.6, 0.8 and 1.0 respectively, and X on behalf of the climbing altitude factor. And based on range of mileage, we classed the cycling difficulty factor of 0-50 km ,50-80 km ,80-120 km ,120-160 km ,160-200 km, as 0.2, 0.4, 0.6, 0.8 and 1.0 respectively, and *Y* on behalf of the cycling mileage factor, see Table 3. Table-3: Daily difficulty for a 22-day cycling on the southern Sichuan-Tibet Line.

Table-3: Difficulty Analysis of Daily Cycling

X	Calendar (*i*th day)	Y	Calendar (*i*th day)
0.2	1、8、17	0.2	12
0.4	9、14	0.4	3、4、5、8、11、13、19
0.6	2、3、13、20、21、22	0.6	2、6、7、10、14、15、16、21
0.8	4、6、7、12、11、15、16、18、19	0.8	1、9、17、18、20
1.0	5、10	1.0	22

During the 22-day trip, except for the first day when the road was relatively flat and in good condition, all the other 21 days from Ya 'an City to Lhasa was two-way dual-lane highway, where road became narrow and the winding mountain road was surrounded by towering mountains on one side, while a raging river or a deep cliff on the other side. Moreover, when cycling in western Sichuan in the second to tenth days, which mainly located in the Hengduan Mountains, the terrain undulation became serious and many tunnels appeared. Usually, cyclists need to pass through about 6 tunnels in one day, where is not well lit and prone to water accumulation, so the road conditions are very dangerous. In particular, the vehicles in this section are mainly semi-trailers and large off-road SUVs traveling into Tibet, both of which are relatively dangerous. The blind area of the former is large, so it is hard to notice the cyclists on the roadside, while the latter travels at faster speeds, all of which will bring potential danger to cyclists. According to the actual road conditions during the 22-day trip, the actual daily cycling mileage gap is very obvious, see Fig 3.

The comprehensive difficulty index of daily cycling was established according to the climbing altitude factor *(X)* and the cyclng mileage factor *(Y)*, as follow:

$$D_i = W_x X_i + W_y Y_i \ (i = 1, 2 \ldots, 21, 22)$$

Here, *Di* is on behalf of the comprehensive difficulty index of *i*th day cycling on the southern Sichuan-Tibet Line. *Xi* is the *i*th day climbing altitude difficulty factor, and Y_i is the *i*th day cycling mileage difficulty factor. The comprehensive difficulty index of cycling on the southern Sichuan-Tibet Line during 22 days is shown in Figure 3.

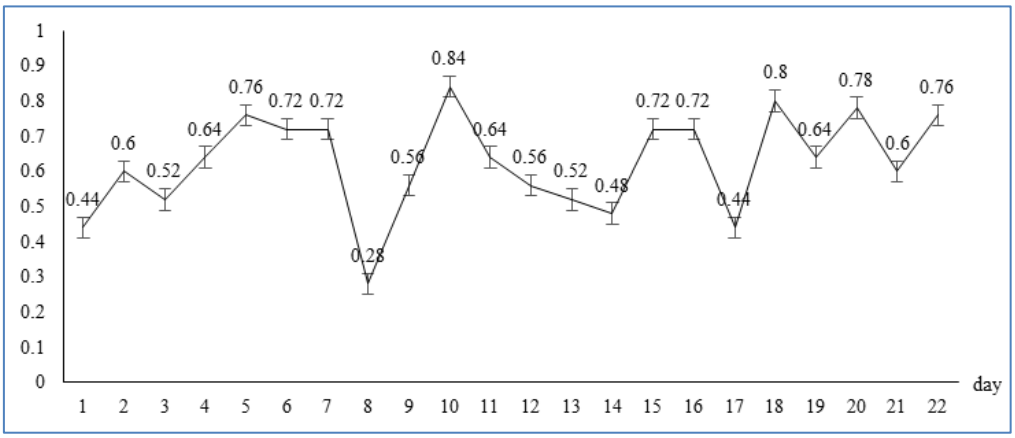

Fig-3: The comprehensive difficulty index of daily cycling on the southern Sichuan-Tibet Line

It can be clearly seen that the difficulty of cycling was fluctuated obvious during the 22-day journey from Chengdu to Lhasa, and showed increase tendency in fluctuation. And more than half of the days' comprehensive difficulty index were above 0.6 including the fourth day, the fifth day, the sixth day, the seventh day, the tenth day, the eleventh day, the fifteenth day, the sixteenth day, the eighteenth day, the nineteenth day, the twentieth day, the twenty-first day, and the twenty-second day, which is very difficult to ride. Thereinto, the comprehensive difficulty index of fifth day, tenth day and eighteenth day is about 0.85, and the difficulty of cycling is extremely high.

4. Emotional interaction between cyclists and travel environment

By nature, tourism experience is similar to a "mirror experience", and through the mirror of the destination, tourists are gazing at the "other" and meanwhile rediscovering themselves. To some extent, tourism experience is a personal, subjective and highly heterogeneous inner feeling, as well as an extension of daily life experience. Usually, the tourism experiences will be different due to different tourism motivations, social economic situation and tourists' own body factors (Crompton, 1997). In general, the tourist motivation in choosing the destination includes seven kinds of social psychological motivations, such as evading the secular environment, seeking for and evaluating themselves, easing and relaxing their mind and body, prestige, returning, improving the relationship between relatives and friends and strengthening social communication, as well as two kinds of social and cultural motivations, namely novelty and education (Xiao, Zhang & Ji, 2017). In any case, Tibet's unique scenery and holy religion attracts many tourists.

However, due to Qinghai-Tibet Plateau entering the rainy season from June to August, rainfall increased significantly and river water soared. With the rise of temperature and the erosion of rain, the mountain is easy to become loose. Since the National Highways 318 in this area is often built near the mountains, falling rocks and debris flows often occur on the road, especially in the Batang-Mangkang section. After crossing the Jinsha River Bridge and entering Tibet, the very first 40 kilometers, is the famous Haitonggou flying-stone area.

With its changeable climate and complex geology, it is really “Gate of Hell” on The Sichuan-Tibet Line, where landslides, rockfall and other geological disasters occur frequently, resulting in rough and muddy road. Moreover, the Haitong River on one side of the road often eats away the roadbed and damages the road. In addition, due to the towering mountains in western Sichuan, it increases the chances of terrain rain. Therefore, it will rain almost every day starting from Ya 'an (commonly known as Rain City), especially when cycling altitude above 4000 meters, there will be snow or hail and other extreme severe weather. Occasionally, there will be serious traffic accidents happened to the cyclists, which hone their physical and psychological qualities. Anyway, various dangers and difficulties require the cyclists to make a lot of thoroughness preparations beforehand, including the cycling route, the estimation of the difficulty of cycling, the mastery of repairing bikes, and so on.

4.1. Influence of Tourism Motivation on Tourism Decision-making

Usually, an important aspect of tourists’ decision making is to choose the tourist destinations with great differences from their domicile environments. Although cycling into Tibet takes a long time, it significantly expands the time span and enabling them to adapt to altitude sickness and perceive the landscape along the way in a more gradual way. And some cyclists even construct cultural symbols such as "eyes in heaven, body in hell", which is on behalf of feelings for cycling on the Sichuan-Tibet line every day. The results of the questionnaire survey show that cyclists who travel for “enjoyed the scenery” account for 46%, ranking the first, while 26% cyclists who travel for “exercised themselves”, besides 23% cyclists focus on spiritual pursuits, mainly to achieve aspirations and reflection on life, and only 4.67% cyclists followed the crowd blindly. Nevertheless, compared with the surrounding suburbs cycling and other cycling sports, the high risk of cycling from Sichuan to Tibet leads few people to follow the crowd. There are two main factors related to tourism motivation that pass the double-tail significance test: first, the cyclists' cognition and preparation for the journey before departure, second, cyclists' choices when encountering difficulties during cycling, see Table 4.

Table-4: Pearson correlation test on main tourism factors of Sichuan-Tibetan cyclists

	motivaton	cope with difficulty	actiong
gender	-0.033	-0.348**	0.175*
age	-0.101	-0.098	0.018
occupation	-0.034	-0.082	0.097
action	.0081	-0.013	1.000
motivation	1.000	0.164*	0.081
preparation	0.171*	0.098	0.332**
resistance	-0.108	-0.039	0.220**
inform family	0.120	0.016	-0.134
teamwork	0.150	0.166*	-0.033
ride days	0.073	-0.103	0.307**
cope with difficulty	0.164*	1.000	-0.013

The investigation also showed that the more fully prepared and clear-motivated beforehand, the more likely action is to be taken. From Table 4, cycling action is significantly related to gender, preparation, and resistance and cycling days. Usually, to some extent, men are superior to women in physical

endurance. Obviously, being well prepared is a prerequisite for cycling, and those who have to overcome the greater the resistance pre-departure that tend to be more stick to finish it, while inadequate preparation often leads to shorter cycling days and tend to be easier abandonment. By comparing tourism motivation with problem 'if you had enough time, physical strength and abundant money, would you ride the Sichuan-Tibet Line?', and further cross analysis showed that 71% of the respondents with "followed the crowd" motivation will not ride Sichuan-Tibet Line even without obstruction, in comparison, the remaining respondents would consider starting cycling as long as conditions allowed. Therefore, for most respondents, cycling into Tibet is still full of ritual and an important aspect of realizing the value of life, see Fig 4.

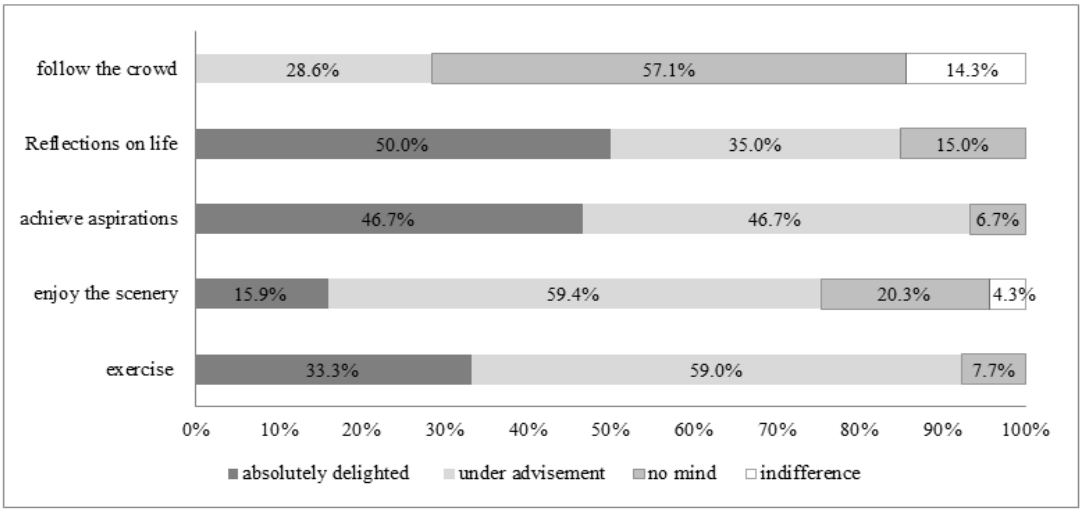

Fig-4: Cross-analysis between motivation and tourism decision-making of Sichuan-Tibetan cyclists

4.2. How do cyclists cope with unexpected travel events

In term of coping with the difficulties, there are generally four choices, see Fig 5. First, hitchhiking instead of cycling through dangerous roads, the proportion of well-prepared respondents is 49.6%, while the proportion of unprepared respondents is 47.8%, and there was no deviation between the two. Second, pushing the bike through dangerous roads, the proportion of respondents who fully prepared and unprepared were 11.8% and 8.7%, respectively, the difference is not significant. Third, they adhere to ride every meter, the proportion of adequate preparation group is as high as 28.3, while the proportion of unprepared group is only 8.7 less than one third of the former. Fourth, those who gave up directly and went home accounted for 14% of all respondents.

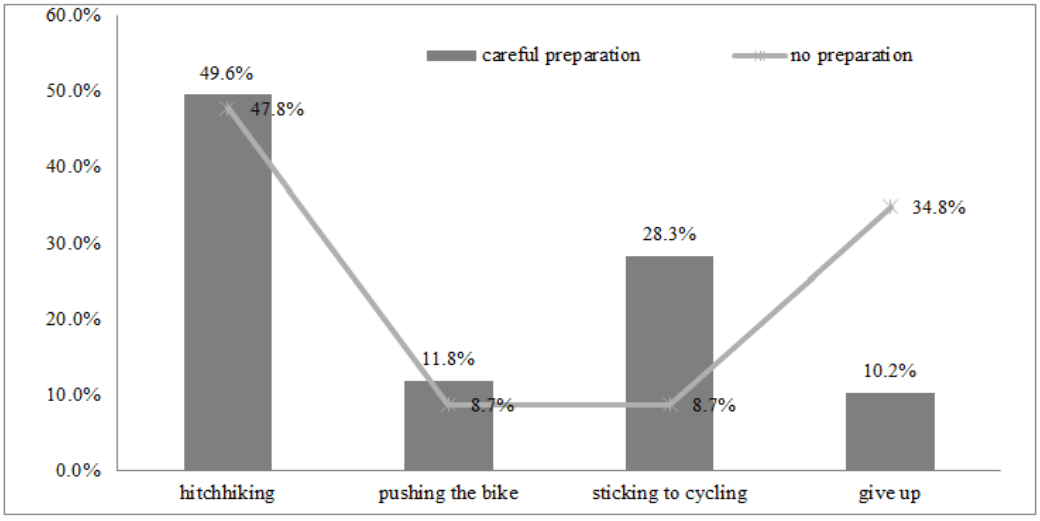

Fig-5: The choice of prepared group and no prepared group when coping with difficulties

But there was a huge difference between the well-prepared group and the unprepared group. Only 10.2% of the well-prepared group gave up, while 34.8% of the unprepared group gave up. To sum up, as the destination, Lhasa is very attractive and tourists have a strong sense of ceremony. Actually, 86% of

respondents choose to continue their journey by change transport tool and other ways. However, different groups show huge deviations on the option of "sticking to cycling" and "giving up the journey". Usually, those who are more clearly predicting actual travel situation and physical excise, especially psychologically prepared, can adhere to cycling to Lhasa, while those who are rush out without preparation often give up halfway, as shown in Fig 5.

In terms of gender, the survey found that male cyclists accounted for the majority, which was in accordance with the author's actual observation on the Sichuan-Tibet Line, and also consistent with other scholar's research (Xiao *et al*. 20,17). In addition, cyclists' choices in the face of difficulties also show significant gender differences, see Figure 6. Once faced with difficulties, 66.2% of female cyclists took hitchhiking to Lhasa, while only 33.8% of men chose hitchhiking. On the contrary, the proportion of men who insist on pushing or cycling bike into Tibet is much higher than that of women, which probably due to the physical quality of men generally superior to women. However, it is worth noting that the proportion of men who give up is also higher than that of women, although men have better physical quality than women when facing setbacks, but their psychological quality is inferior to that of women, and cannot change mind easily, which is exactly corresponding to the proportion of men and women choosing hitchhiking.

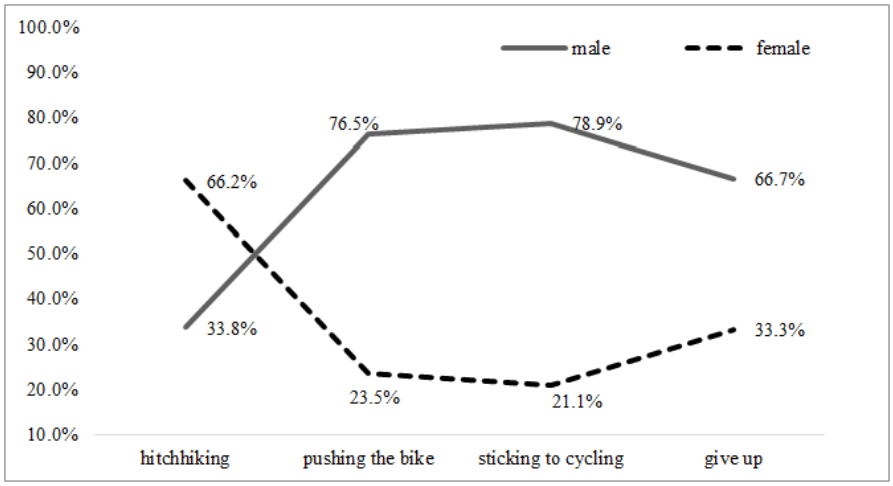

Fig-6: The choice of different genders group when coping with difficulties

From Figure 7, it is obvious that the choice is very different for different motivation groups when faced with difficulties. In particular, the proportion of "follow the crowd" group who give up is as high as 85.7%, while other motivation groups abandonment rate is very low, especially "reflections on life" group no one give up, correspondingly no one of the "follow the crowd" group sticking to cycling.

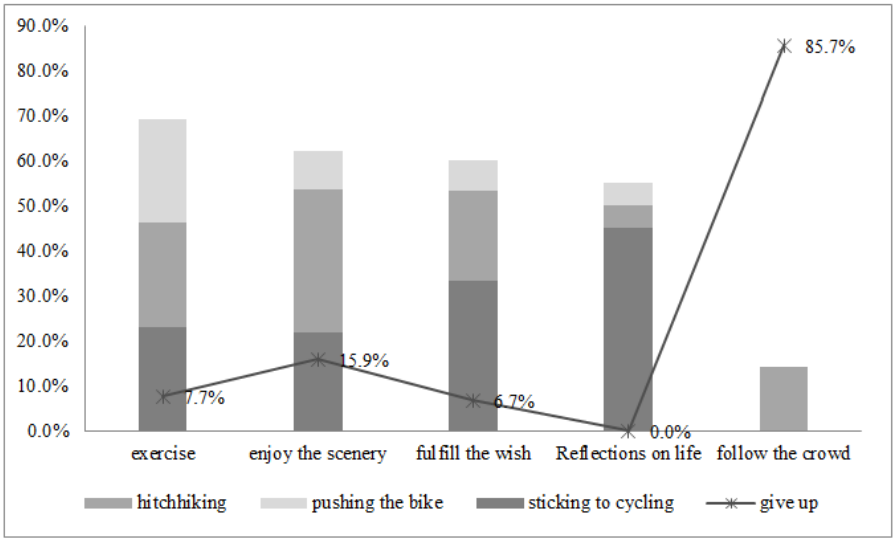

Fig-7: The choice of different motivation group when coping with difficulties

In addition, there were three factors that are significantly related to the way respondents deal with travel difficulties: gender, motivation and teamwork, as shown in Table 4. Actually, through interviews, it was well seen that those who rode in groups were more likely to reach Lhasa than those who rode alone. Interviewee A, for example, said that if she didn't have ridden by herself, she might not choose hitchhiking but insist cycling to Lhasa with her teammates. However, interviewee B said that they were originally a team of 20 people, but later due to differences in physical strength, personality, diet habit and other factors, some of them gave up, and the rest of them restructuring the team to ride into Tibet in 3 teams. Therefore, not the bigger the better, actually, through interviews the riding team of 3-4 members are best.

5. CONCLUSIONS

In this study, on basis of the DEM digital elevation model, according to the author's own 2150 km cycling experience and the surveys, which accurately analyze the daily cycling difficulty of the whole journey and depict the real feelings of the cyclists? Thereout, the 2150 km southern Sichuan-Tibet Line, which was divided into three sections: plain section (Chengdu City - Ya'an City), Hengduan Mountain section (Ya' an City - Basu County) and Tibet plateau section (Basu County - Lhasa City). Especially, the Hengduan Mountain section (Ya' an City - Basu County) is the most difficult line for cycling, we believe that this has been largely due to it passing through "area of three rivers flowing parallel" (Jinsha River, Lantsang, Nujiang River), characterized by its longitudinal range-gorge, steep mountain rushing water, ridge-valley height difference exceeds 2500 meters, changeable weather, the terrain rain and geological disaster frequent area. Further, this paper adopts the observation method and the semi-structured interview method to analyze their tourism experience. The results show that the emotional experience of cyclists entering Tibet has the following characteristics:

(1) In terms of motivation, most respondents think that cycling in Tibet is essentially full of ritual, which is an important aspect to realize the real value of their lives, while only 4.67% of respondents follow the crowd. In addition, there are two main factors significantly related to tourism motivation: the cyclists' cognition and preparation for the journey before departure, and cyclists' choices when encountering difficulties during cycling. Nevertheless, compared with the surrounding suburbs cycling and other cycling sports, the high risk of cycling from Sichuan to Tibet leads few people to follow the crowd blindly.

(2) As far as preparations is concerned, the more fully physical and psychological preparation the rider before departure, the more familiar he is with the route environment, and the more likely he can stick to cycling to the end. Correspondingly, only 10.2% of cyclists gave up in the fully prepared group, compared with 34.8% in the unprepared group.

(3) Due to different motivations and genders, there are obvious differences in cyclists' choices when encountering difficulties during cycling on southern Sichuan-Tibet Line. In the face of difficulties, 66.2% of female cyclists chose to hitchhike and continue their journey to Lhasa, while only 33.8% of men chose to hitchhike. Once facing with difficulties, the cyclist abandonment rate in the 'follow crowd cyclists' group is as high as 85.7%, while other motivation groups abandonment rate is very low, especially, to the 'reflections on life cyclists' no one give up. It is worth noting that the proportion of men who give up is much higher than that of women, although men have better physical quality than women when facing setbacks, but their psychological quality is inferior to that of women, and cannot change mind easily, which is exactly corresponding to the proportion of men and women choosing hitchhiking.

Author Contributions

Xiaojia Guo analyzed the data and wrote the paper; Wei Wang distributed questionnaires and conducted field interviews. All authors read and approved manuscript.

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