

Analysis on the Impact of haze on Beijing Residents' Traveling Intention and Decision-Making

Rongfan Zhu*

School of Statistics, Jiangxi University of Finance and economics,
Jiangxi Nanchang, China

*Corresponding author e-mail: ZhuRongFan@163.com

Abstract. Since the 21st century, there has been a wide range of air pollution problems in China. Due to the combined effects of many factors, the air pollution problem in Beijing is the most prominent. Coupled with the special status of the Chinese capital, the haze problem in Beijing has become the focus of attention of all walks of life. In recent years, in order to reduce the hazards of haze, tourism products and tourism routes with the theme of avoiding haze become quickly popular between Beijing residents. Behind the hot sales of haze-avoiding products, how does the haze affect the travel wishes and decisions of Beijing residents? This is a major issue concerning the development of the tourism industry in severely hazy areas and is also an academic issue worthy of in-depth study. Therefore, this article takes a sample survey of Beijing residents as an example to analyse the specific impact of haze on residents' willingness to travel and decision-making from the perspective of residents in Beijing in order to promote the reduction of the impact of haze on people's travel and the development of the tourism industry.

1. Introduction

Haze refers to the atmospheric phenomenon of air visibility below 10 km due to the accumulation of solid and liquid particles (especially PM_{2.5}) [1]. The increasingly severe haze weather in Beijing has gradually become a focus issue for the national media and all walks of life. [2] In recent years, in order to reduce the hazards of haze, tourism products and tourism routes with the theme of avoiding haze become quickly popular between Beijing residents. Behind the hot sales of haze-avoiding products, how does the haze affect the travel wishes and decisions of Beijing residents? This is a major issue concerning the development of the tourism industry in severely hazy areas.

Although haze has become a new hot spot in academic research in China, the focus of research has been on the concepts, causes, hazards, and prevention of haze. There are relatively few direct studies on the impact of haze on leisure and tourism. [3] Wang Luffing used Shanghai as an example to analyze the demand and supply of Shanghai residents' sports activities under hazy and inhospitable scenery. The study found that most Shanghai residents had insufficient awareness of haze training and the frequency of residents' fitness activities was affected by hazy weather. [4] The changes were not significant, and 79% of residents with fitness habits persisted in sports activities (including indoor and outdoor) in hazy weather; [5] Li Jing et al. used structural equation modeling to explore the haze perception and risk perception of tourists from Beijing and abroad. The structural relationship between satisfaction, loyalty,



and loyalty, and the differences in perceptions of the above four dimensions between domestic tourists and international tourists.

In summary, from the perspective of tourists, there are few studies on the impact of haze on tourists' willingness to travel. Therefore, taking the sample survey of residents of Beijing as an example, this paper aims to analyze the specific impact of haze on the residents' willingness to travel from the perspective of Beijing residents, so as to promote the reduction of the impact of haze on people's travel and the development of the tourism industry.

2. Research methods and data sources

This study used questionnaires to investigate the specific impact of haze on Beijing residents' tourism and the overall feelings of residents on hazy weather. Cross-analysis, factor analysis and other methods were used to analyze the specific impact of haze on Beijing residents' tourism and the overall feelings of residents on haze weather. A total of 284 questionnaires were distributed, of which 256 were valid and the recovery rate was as high as 90%.

The questionnaire consists of four parts, a total of 16 topics, of which, the first part is the basic information of the survey objects, including the subject's gender, age, education level and monthly income 4 topics. The second part is the impact of smog on the willingness of tourists to travel, including 5 topics. The third part is the specific impact of haze on travel plans, including five topics. The fourth part is the overall feeling of the subject of hazy weather, including two topics. In addition to basic information, other topics are based on a 5-point Likert scale design.

3. Empirical analysis

3.1. Demographic characteristics of the sample

According to Table 1, about 70% of females and 30% of males are in the sample. From an age point of view, Beijing residents aged 20-30 account for 65.6% of the sample, followed by residents under 20 years of age accounting for 20.3%. This is similar to the age range of loving travel. Undergraduates account for 73.4%, followed by college graduates who accounted for 12.5%, with the least number of high school graduates and masters and above, which is consistent with the actual situation of education. Since the age of the respondents is mainly below the age of 30, the most number of monthly income is below 2500 yuan, accounting for 56.3%.

Table 1. Demographic characteristics of the sample.

Feature	Eigenvalues	Frequency	Frequency (%)
Gender	male	68	26.6
	female	188	73.4
Age	age under 20	52	20.3
	20-30 years old	168	65.6
	30-40 years old	12	4.7
	age beyond 40	24	9.4
	below junior high school	8	3.1
Level of education	High School	16	6.3
	College	32	12.5
	Undergraduate	188	73.4
	Master degree and above	12	4.7
Monthly income	2500 yuan or less	144	56.3
	2500-4999 yuan	56	21.9
	5000-9999 yuan	32	12.5
	More than 10, 000 yuan	24	9.4

3.2. Analysis of the degree of influence of haze on residents' willingness to travel

According to Table 2, more than 60% of residents think that hazy weather has an impact on their willingness to go and the way they travel. Among them, more than 20% of the residents think that the impact is very large. Specifically, haze has the greatest impact on residents' willingness to travel outside. The degree of influence on indoor travel will be less.

Table 2. Distribution of degree of influence of haze weather.

	Willingness to go out frequency %	Travel way frequency %	Indoor travel frequency %	Outdoor travel frequency %
Absolutely not	6.3	12.5	21.9	6.3
not	9.4	10.9	23.4	7.8
uncertain	12.5	14.1	25.0	9.4
yes	45.3	42.2	23.4	32.8
much	26.6	20.3	6.3	43.8
sum	100.0	100.0	100.0	100.0

3.3. Community differences in residents' willingness to travel affected by haze

The cross-tabulation analysis of gender, age, education level, monthly income and haze on the subject's tourist willingness was conducted to analyze whether the degree of influence of haze on the residents' willingness to travel has group differences. According to the chi-square test results in Table 3, the P values of both are less than 0.05. Therefore, the original hypothesis that the residents who refuse to accept different ages and monthly incomes due to haze-influence is not significantly different, that is, we think differently. Residents' willingness to travel by age and monthly income is significantly affected by haze.

Table 3. Chi-square test.

	Value	Df	Sig.
Pearson	27.422	12	0.007
Likelihood ratio	15.643	12	0.208
Linear and Linear Combinations	0.383	1	0.536
N in the effective case	256		

In order to further analyze the differences in the willingness to choose different haze and monthly income for traveling abroad in a hazy weather, we use group statistics to express. Table 4 shows that residents under the age of 20 are less likely to travel in fog and haze than other ages, suggesting that young people are more reluctant to travel on haze days. This may be more concerned with media news among young people. Haze hazards are more aware of the relevant issues; residents aged 30-40 years are significantly more likely to choose to travel outside the country when they choose to go to haze. It can be seen that residents aged 30-40 years are more likely to choose to travel in the haze weather.

Table 4. Group statistics of the willingness of residents of different ages to choose to travel in haze.

Age	Mean	N	Variance
age under 20	2.23	52	0.859
20-30 years old	2.31	168	0.658
30-40 years old	3.00	12	3.000
age beyond 40	2.33	24	0.267
sum	2.33	256	0.732

3.4. General feelings of residents on hazy weather

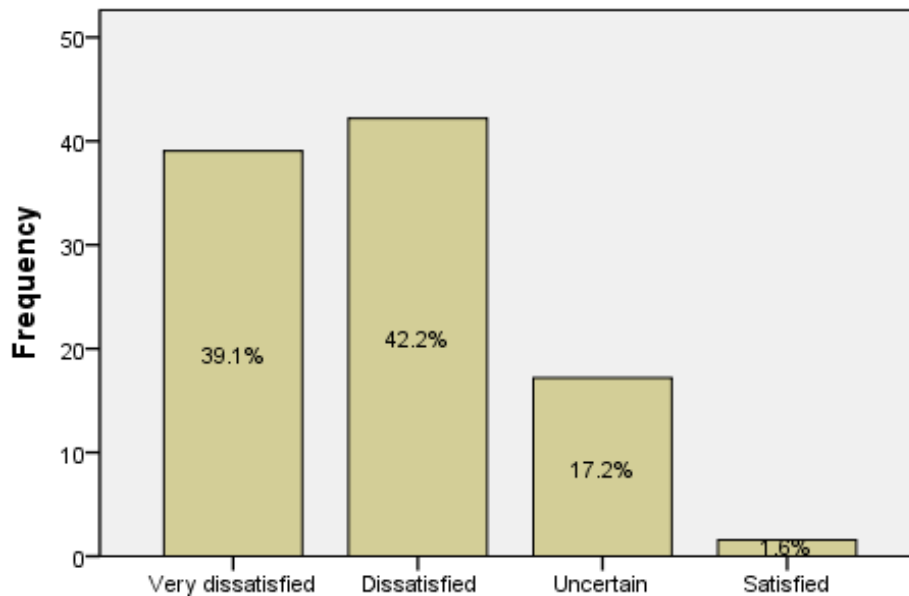


Figure 1. Bar chart of satisfaction with travel in hazy weather.

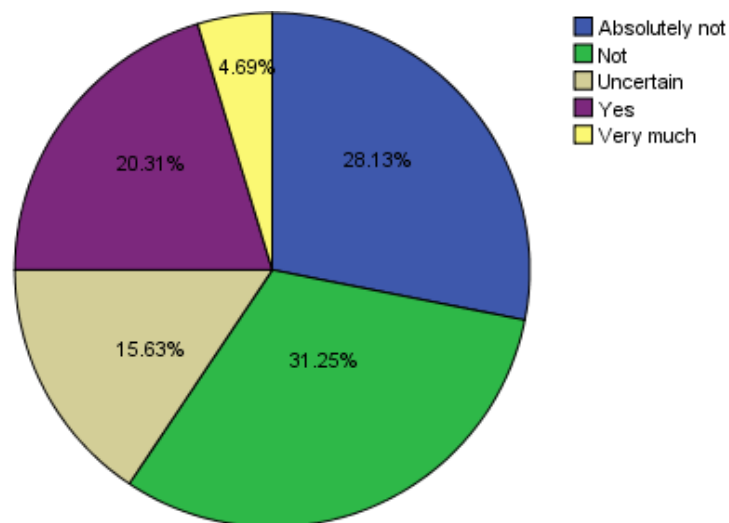


Figure 2. Pie chart of whether haze has a positive influence on tourism.

As can be seen from Figure 1, more than 80% of the residents are not satisfied with traveling in fog and haze. As can be seen from Figure 2, about 60% of residents believe that smog has no positive impact on tourism. It can be seen that residents' overall feeling of haze is poor.

3.5. The comprehensive effect of haze weather on travel

In order to analyze the overall impact of haze weather on residents' travel, taking into account the five aspects of haze and weather travel planning, there is a certain degree of correlation, and it is proposed to conduct factor analysis on the five aspects of haze and weather travel planning. Construct a comprehensive influence function.

Table 5. Examination of KMO and Bartlett.

Kaiser-Meyer-Olkin measure		0.725
Approximate Chi-square		127.387
Bartlett's sphericity test	df	10
	Sig.	0.000

From Table 5, it can be seen that the Kaiser-Meyer-Olkin metric for a sufficient sampling is 0.725, which is close to 1, and Bartlett's sphericity test has a P-value of $0.000 < 0.05$, which is suitable for factor analysis.

Table 6. Explanation of total variance.

Ingredient s	Initial feature value			Rotation squared and loaded			
	sum	% of variance	% of accumulation	sum	% of variance	% of accumulation	% of
1	2.923	58.463	58.463	2.540	50.793	50.793	
2	0.824	16.473	74.936	1.207	24.143	74.936	
3	0.625	12.503	87.439				
4	0.447	8.942	96.381				
5	0.181	3.619	100.000				

From Table 6, it can be seen that the extraction of two common factors is appropriate, representing a total of 75% of the original variable information, and the extraction effect is good.

Table 7. Rotating component matrix.

Standardized raw variables	Ingredients	
	1	2
Shorten travel time	0.780	0.102
Change travel destination	0.654	0.452
Delay travel time	0.905	0.159
Cancel travel plan	0.814	0.183
Go to other cities	0.148	0.966

From Table 7, we can see that the coefficient of public factor 1 is the largest in shortening travel time, delaying travel time, and canceling travel plans. Therefore, public factor 1 can be named as the influence of haze on travel time; the coefficient of public factor 2 is changing travel destinations. , go to other cities in the largest, so the public reason 2 can be named as haze on the impact of tourism sites.

4. Conclusion

After analyzing the impact of haze on Beijing residents' travel wishes, overall feelings, travel plans, etc, we find that most residents believe that hazy weather has an impact on their willingness to travel and the way they travel. Residents under the age of 20 are even more reluctant to travel on haze days; residents aged 30-40 years fluctuate in their willingness to choose to travel in hazy weather; more than half of residents will change their travel plans due to hazy weather; Using factor analysis to construct a comprehensive impact function, we have obtained two common factors: the impact of smog on travel time and the impact of smog on tourist destinations; among them, the weight of the impact on travel time is relatively larger. It can be seen that people tend to avoid hazy weather tourism by delaying or shortening travel time, and do not easily change travel locations. This is because there are large differences between tourism destinations and their replacement is relatively small. Local governments, tourism bureaus, etc. should correctly understand the influence of haze on residents' travel wishes and

plans, and in addition to increasing the uniqueness and attractiveness of scenic spots, they should innovate tourism products and tourism methods that reduce haze damage.

References

- [1] GUO Lijun, GUO Xueliang, FANG Chungang, ZHU Shichao. Observation and Analysis of the Characteristics of Generation, Evolution, and Transformation of a Severe Haze in North China [J]. Chinese science: Earth Sciences, 2015, 45 (04): 427 - 443.
- [2] Peng Jian, Guo Siyuan, Yan Yanan, Zhang Song. A Study on Residents' Perceptions and Attitudes towards the Impact of the Haze in Beijing [J]. China Polity, Resources and Environment, 2016, 26 (10): 168 - 176.
- [3] Peng Jian, Zhang Song, Luo Shiqi, Yang Lu. Beijing Residents' Perceptions of haze and Their Tourism Intentions and Behaviours [J]. World Geography, 2016, 25 (06): 128 - 137.
- [4] Li Mengyao, Zhao Yubo. Study on the Impact of Haze on China's Inbound Tourism: Taking Beijing Inbound Tourism as an Example [J]. Agricultural Machinery of China, 2016, 43 (07): 90 + 94.
- [5] TANG Chengcai, FENG Shi, DAI Xiangyi. Analysis of the influence of hazy weather on Beijing inbound tourists [J]. Journal of Arid Land Resources and Environment, 2017, 31 (08): 198 - 202.
- [6] Ban Jie, Zhou Lian, Zhang Yi, Brooke Anderson G, Li Tiantian. The health policy implications of individual adaptive behavior responses to haze pollution in urban China. [J]. Environment international, 2017, 106.
- [7] Jing Li, Philip L. Pearce, Alastair M. Morrison, Bihu Wu. Up in Smoke? The Impact of haze on Risk Perception and Satisfaction of International Tourists in Beijing [J]. International Journal of Tourism Research, 2016, 18 (4).