

Research on the Evolving Tourists' Demands across the Covid-19 Pandemic: A Case Study of the Wuzhen Town

Hu Feng^{1,a,*}, Li Yanying^{2,b}, Liao Qiao^{2,c}, Jin Yijie^{2,d}

¹*School of Business, Taizhou University, Taizhou, 318000, China*

²*College of Economics and Management, Zhejiang Normal University, Jinhua, 321004, China*

^a*hufeng_1978@126.com*, ^b*13265011549@163.com*, ^c*19550591737@163.com*,

^d*zsdjinyijie@126.com*

**Corresponding author*

Keywords: COVID-19 Pandemic; Wuzhen; Tourist Demands; Tourist Reviews; Text Analysis

Abstract: Previous literature has shown that tourists prefer travel products that allow for social distancing during the COVID-19 pandemic. However, existing studies generally work on this topic from a mesoscopic perspective, and little research focuses on the micro-level changes in specific tourist preferences during the crisis. To address this gap, this study uses text mining techniques to investigate the changes in the mentions of Wuzhen Town's attributes in online reviews during different stages of the pandemic's development. The findings show that tourists have consistently shown increased interest in specific attributes of Wuzhen, such as experience, service, and boat rides, while some night attributes, such as B&B, bar, and light, have shown temporal attention unique to the pandemic period. Based on the cocooning and evolution theory, this paper further discusses the evolving tourist demands across epidemics and puts forward suggestions for the tourism industry to effectively respond to pandemics.

1. Introduction

The tourism industry is highly sensitive to safety issues, making it vulnerable to natural disasters, pandemics, and other crises. The COVID-19 pandemic, which broke out in early 2020, caused significant disruptions to the development of the tourism industry worldwide. By around 2023, the pandemic gradually came under control, and people's travel activities resumed slowly. However, the three-year-long pandemic has had a lasting impact on our way of thinking, our way of life, and our demands and behaviors related to tourism [1]. Some of these changes have become permanent, leading to a new trend in tourism [2].

Tourists are the main actors in the tourism sector and play a crucial role in recovering the post-pandemic tourism industry. Tourists' travel preferences refer to their psychological inclination towards a particular travel destination and are influenced by the tourism environment. Previous studies indicate that tourists make destination choices in risky situations based on their expectations and perceptions of the destination attributes [3]. Therefore, the occurrence of a pandemic will, to some extent, lead to changes in tourists' travel demands and preferences. After experiencing a

pandemic, tourists tend to prefer natural and cultural tourism destinations [4], opt for self-driving travel [5], and pay more attention to the hygiene and service conditions of the destination. In the post-pandemic era, tourism practitioners must actively monitor changes in tourist preferences and make timely adjustments to their operations to meet the dynamic needs of tourists.

Existing literature on how the COVID-19 pandemic affects tourists' demands primarily focuses on Meso-level perspectives [2], such as investigating how the pandemic affects tourists' travel intentions or how it influences tourists' destination choices [6]. However, there is limited research that explores the changes in tourists' preferences for travel services during different stages of the pandemic from a micro-level perspective, with a particular lack of targeted empirical studies focusing on specific scenic areas. The research gap shows the need to analyze changing trends in tourist demands during different phases of the pandemic, focusing on specific types of tourism destinations. This study focuses on Wuzhen, a typical tourist town in China, to analyze and understand the effects of the COVID-19 pandemic on the demands of tourists visiting such towns. This study aims to provide practical advice for tourism towns on how to respond to major public health events.

2. Literature Review

2.1. The Impact of a Pandemic on Tourist Demands

The impact of the pandemic on tourist demands has been widely discussed and researched in academia. This research has focused mainly on predicting tourist demands during the pandemic, identifying the factors that influence tourist demands, understanding tourists' destination choices, and exploring their travel intentions during the pandemic [7]. Yang et al. (2021) investigated the changes of tourist preferences during the pandemic, taking 5A-level scenic spots as an example [8]. They found that tourists avoid crowded tourist destinations and opt for less well-known spots during a pandemic. As the pandemic progressed, health-related factors became increasingly important to tourists. As a result, natural landscapes and religious scenic areas became more popular due to their ability to meet tourists' demands for psychology and healthcare. In another study, Wang & Liu (2020) surveyed tourists' travel intentions after the pandemic [9]. They found that within 1-2 months after the pandemic, there would be a small-scale peak in local tourism, while 3-4 months after the pandemic, travel to other cities or tourist attractions outside the province would become the primary tourist demand.

Through a literature review, it is found that the research on the impact of the pandemic on tourist demands primarily adopts a Meso-level perspective, focusing on the overall trends of tourists' demand for tourist destinations under the pandemic. There has been limited research on tourists' preferences for destinations such as tourist towns. Additionally, the research has overlooked how tourists' preferences for specific attributes of destinations have changed during the pandemic. Investigating the changes in tourists' demand for specific tourism attributes of destinations during the pandemic is crucial, as it can provide targeted directions for optimizing services for specific types of scenic areas in the post-pandemic era and offer insights for making rapid responses to similar sudden public health events [2].

2.2. Research on the Variation of Tourist Behavior during a Pandemic

The changes in tourist behavior during the COVID-19 pandemic have received significant attention from scholars worldwide. Abdullah et al.(2020) conducted a survey analysis with 1,203 respondents to examine the impact of the pandemic on tourist behavior [10]. Their findings indicate a trend of shortened travel distances among tourists during the pandemic. Fan et al. (2023)

discussed the reasons for changes in tourist behavior based on the Theory of Planned Behavior [11]. Their study suggests that tourist behavior is positively correlated with the social responsibility of tourism enterprises, tourists' trust in domestic pandemic control measures, and destination promotion strategies, while negatively correlated with travel intentions and risk perception. Morar et al. (2021) assessed the trait sensitivity levels of the Behavioral Activation System (BAS) and Behavioral Inhibition System (BIS) [12]. The study illustrates that specific pandemic-related information and responding mechanisms to a pandemic may influence tourist behavior.

Current research on the impact of pandemics on tourist behavior largely examines the period during the pandemic but fails to explore how tourist behavior evolves throughout the entire pandemic process. Behavior evolution theory suggests that an individual's behavior is influenced by their environment. As a result of the pandemic, tourists have had to adapt to a new environment (Ren & Luo, 2003), leading to the development of new travel behaviors and habits that persist and become trends [13]. These behaviors are expected to continue even after the pandemic is eliminated. Therefore, studying adaptive tourist behaviors during pandemics can provide tourism destinations with valuable insights into new trends in tourist demands.

2.3. Research on Tourist Demand Based on Online Reviews

The widespread use of the Internet has stimulated tourists to share their travel stories with others through tourism platforms such as Ctrip.com. Online reviews provide valuable information that can reflect tourists' expectations and perceptions of various tourism attributes. In recent years, there has been increasing interest in the academia in using text mining to extract tourists' experiences from online reviews [2]. Jin et al. (2017) analyzed the characteristics of rural tourists' demands by examining online word-of-mouth evaluations of 48 rural tourism sites in Shanghai [14]. Li et al. (2020) used online data from the Baidu search engine to develop a demand prediction model that reflected tourist demand. Compared with traditional data, such as questionnaires and interviews, large-scale online reviews obtain more objective, authentic, and comprehensive information [7]. This paper analyzes online reviews by tourists who visited Wuzhen in recent years, using text mining methods to identify changing patterns and trends in tourists' attention to service attributes in different COVID-19 stages.

3. Research Method

3.1. Data Collection

With the advent of the internet, online tourism platforms have become the primary channels for travelers to share their travel experiences. Tourist reviews on these platforms are crucial in understanding the needs and experiences of tourists. In this study, we used web crawler software to collect reviews of Wuzhen from various Chinese tourism platforms. Our sample included reviews from January 1, 2018, to October 20, 2023. After eliminating invalid, duplicate, and anomalous data, we obtained a total of 36,360 reviews, consisting of 25,815 entries from Dianping.com, 2,140 entries from Qunar.com, 1,297 entries from Tongcheng.com, and 7,108 entries from Ctrip.com.

3.2. Analysis Methods

We employed text mining tools within KH Coder, such as word frequency statistics, Part-of-Speech analysis, Correspondence Analysis, and Crosstab analysis, to analyze the research data. Our aim was to conduct a statistical analysis of high-frequency keywords across time series. Using the year as a variable (2018-2023), we compared the frequency of high-frequency attribute words

mentioned in tourist reviews across different years to investigate the changing trend in tourists' attention to the service supply of Wuzhen. Firstly, we applied Correspondence Analysis to visualize the distribution of high-frequency nouns along the variable (year) dimension, thereby revealing a rough changing pattern of tourist attention to tourism attributes over time [15]. Whereafter we included 72 nouns with a term frequency (TF) greater than 1000 in the pre-analysis. After a filtering and combining, we identified 25 high-frequency themes related to Wuzhen (see Table 1) for the following research.

To further investigate the changes in attention to attributes, we applied the binomial proportion test to statistically uncover the changes in attribute attention across different years. The Z-value is employed to indicate the significance of the comparison of attribute attention between different time periods. At a significance level of 0.05, Z-values greater than 1.96 (or less than -1.96) imply a significant positive (negative) change in the comparison group relative to the reference group, while absolute Z-values lower than 1.96 indicate no significant difference.

4. Findings

4.1. The temporal distribution of tourist attention

To understand the differences of tourist attention across time series, we set the year as an external variable for correspondence analysis in KH Coder. As shown in Figure 1, the closer the vocabulary is to the variable (highlighted in red in Figure 1), the more representative it is of the tourist focus during that period. Figure 1 shows that user preferences (theme word attention) exhibit clustering patterns in the temporal distribution, which aligns closely with the stages of the pandemic. The first stage, pre-pandemic period (2018-2019), as indicated by the clustering of high-frequency keywords in Figure 1, primarily focuses on the tourism landscape attributes of Wuzhen (such as bridges and streams). The second stage, in-pandemic period (2020-2021), sees the tourist attention shift towards lodging services in Wuzhen (such as accommodation and B&B). The third stage, the recovery period (2022-2023), witnesses the tourist attention being concentrated on the experiential aspects and services of Wuzhen (such as service and boat).

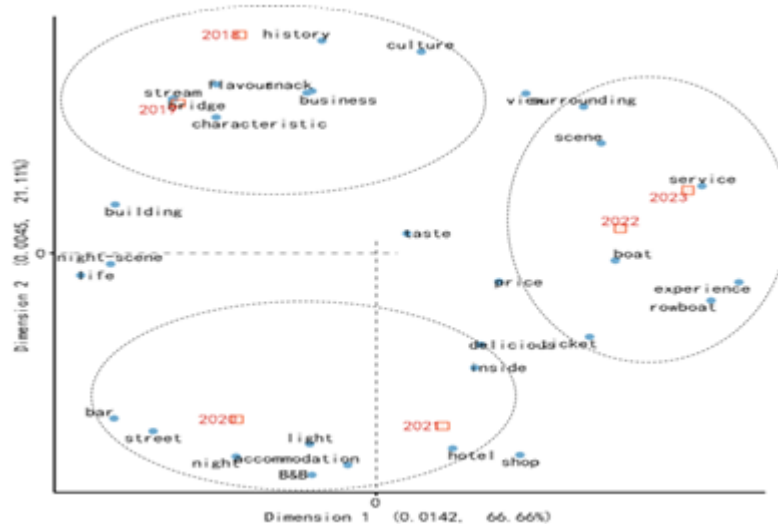


Figure 1: The temporal distribution of frequently mentioned topics.

4.2. Changes in Tourist Preferences across the Pandemic

Based on the formula of the binomial proportion test introduced in section 3.2, we further

analyzed and compared the differences in tourist preferences across the three periods (18-19, 20-21, 22-23). Table 1 displays the changes in tourist preference for 25 Wuzhen attributes during the three stages. In comparison to the pre-pandemic period (18-19), 18 out of the 25 observed attributes showed significant changes during the in-pandemic (20-21) and the recovery period (22-23). Additionally, when comparing the recovery period (22-23) with the pre-pandemic period (18-19), 19 attributes exhibited significant changes. Evidence from the statistical comparative analysis of word frequency in online reviews of Wuzhen across the temporal sequence shows significant differences in tourist preferences across the COVID-19 pandemic.

Table 1: Importance Weight of Top 25 Wuzhen Attributes.

Attribute	Word frequency distribution (2018-2023)			Binomial distribution probability test (Z-score)		
	2018-2019	2020-2021	2022-2023	18-19 VS 20-21	20-21 VS 22-23	18-19 VS 22-23
night-scene	1972	2803	1265	0.805 n.s.	8.291 **	8.452 **
ticket	1720	2793	1777	-3.774 **	-2.597 **	-5.754 **
scene	1118	1648	1216	-0.366 n.s.	-6.096 **	-5.910 **
stream	1361	1598	842	5.973 **	2.733 **	7.709 **
view	1069	1391	1054	2.794 **	-6.290 **	-3.292 **
characteristic	912	1153	617	3.219 **	2.001*	4.660 **
B&B	679	1312	589	-6.155 **	5.642 **	-0.196 n.s.
snack	820	1073	615	2.313*	0.590 n.s.	2.572 **
price	639	1031	606	-2.104*	0.082 n.s.	-1.793 n.s.
business	654	889	524	1.324 n.s.	0.024 n.s.	1.187 n.s.
surrounding	559	773	606	0.914 n.s.	-5.324 **	-4.055 **
boat	734	1267	959	-3.778 **	-5.961 **	-8.825 **
experience	575	1147	1122	-6.320 **	-12.447 **	-16.833 **
building	590	790	352	1.533 n.s.	4.452 **	5.491 **
bar	492	811	254	-2.227*	9.058 **	6.709 **
accommodation	415	753	377	-3.673 **	2.641 **	-0.810 n.s.
history	533	590	356	4.625 **	-0.332 n.s.	3.711 **
culture	493	598	362	3.013 **	-0.384 n.s.	2.277*
street	419	733	260	-3.060 **	7.203 **	4.159 **
night	402	701	290	-2.942 **	5.168 **	2.274*
bridge	1643	2013	1058	5.340 **	3.154 **	7.567 **
shop	307	646	392	-5.413 **	-0.438 n.s.	-5.296 **
light	344	590	297	-2.461*	2.259*	-0.079 n.s.
delicious	307	484	289	-1.119 n.s.	-0.158 n.s.	-1.139 n.s.
service	302	477	421	-1.136 n.s.	-6.113 **	-6.558 **
Amount of reviews	21594	31394	18529			

Based on Table 1, we observed significant linear changes in tourists' interest in certain tourism attributes across the processing of the pandemic (time series). For instance, tourists' attention to certain attributes, such as ticket, boat, and experience, continuously increased over time. While tourists' interest in some attributes, such as stream and bridge, exhibited a consistent decrease. During the in-pandemic period, tourists' interest in some attributes, such as B&B, bar, accommodation, night, street, and light, was notably higher than in other periods. Throughout the

pandemic processing, the changes in tourists' interest in some attributes, such as snack and business, did not show significant variations over time. Furthermore, in the recovery period, tourists' interest in some attributes, such as surrounding, view, and experience, was notably higher than in the other two periods. The variations of attribute attention imply shifts in tourist demand across the pandemic: ticket, experience, and service-related attributes became more expected along with the processing of the pandemic, while certain scenic attributes (e.g., stream and street) experienced a decline over time. Significantly, accommodation and night-themed activities were particularly favored during the in-pandemic period.

5. Implications

5.1. Discussions

This paper uncovers several implications of tourist demand changes for Wuzhen attributes across the COVID-19 pandemic. Firstly, tourists' preference for attributes exhibits a temporal clustering distribution: Tourist attention was concentrated on scenic attributes before the pandemic (2018-2019). While tourist interest shifted to night-related attributes during the in-pandemic period (2020-2021). In the recovery period (2022-2023), tourist attention transfers to experiential attributes.

Secondly, the pandemic has had a sustained impact on tourists' demands, showing a certain degree of "evolutionary" trend: tourists' attention to service-related attributes continues to increase, while the attention to some scenic attributes decreases continuously. This may be because tourist destinations actively responded to the pandemic and continuously optimized tourism experiences and services. In the post-pandemic period, tourists adapt psychologically and behaviorally to high-quality experiences and services, gradually forming a new trend in demand. At the same time, over time, tourists may lose interest in certain tangible attributes, leading to a slight decline in their attractiveness. Thirdly, during the in-pandemic period, tourists' attention to some night-related attributes may significantly strengthen: the heightened self-protective awareness of tourists during the pandemic leads to increased attention to attributes related to social distancing, such as nighttime activities and accommodation.

5.2. Conclusions

Based on examining 36,360 online tourist reviews, this study uncovered the changes in tourist preferences in Wuzhen at different stages of the COVID-19 pandemic and discusses the patterns and trends of tourist demand that vary across the pandemic. This paper is one of the few studies that examine the changes in tourist demand from a micro across pre-, in-, and post-pandemic based on large-scale travel review data. This study confirms that a pandemic not only has an immediate impact on tourist demand but also has a lasting influence on tourist behavior and demand.

This paper empirically verifies the argument made by Hu et al. (2021) regarding the evolution of tourist behavior during the pandemic: during the pandemic, tourists exhibit "cocooning behavior" to avoid risks, leading to an increased expectation for certain tourism attributes, which behavior may disappear after the pandemic [2]. However, under the prolonged impact of the pandemic, tourists' psychology and behavior may tend to "habitual" or "adaptive" changes, resulting in the variation of behaviors and preferences, subsequently evolving into a new trend of demands.

This study holds important implications for tourism practitioners in dealing with pandemics. The findings suggest that tourism practitioners should continuously optimize services across the entire pandemic processing, focus on project experiences and services, and enhance tourists' satisfaction. As for the mid-pandemic period, tourism practitioners should increase various experiential projects and improve crowd management to meet the tourist "social-distance" demands.

Acknowledgements

This research is supported in part by Humanities and Social Science Fund of Ministry of Education of China (Grant No. 21YJA630031).

References

- [1] He, H., & Harris, L. (2020). *The impact of Covid-19 pandemic on corporate social responsibility and marketing philosophy*. *Journal of Business Research*, 116, 176–182.
- [2] Hu, F., Teichert, T., Deng, S., Liu, Y., & Zhou, G. (2021). *Dealing with pandemics: An investigation of the effects of COVID-19 on customers' evaluations of hospitality services*. *Tourism Management*, 85, 104320.
- [3] Perpiñá, L., Prats, L., & Camprubí R. (2021). *Image and risk perceptions: An integrated approach*. *Current Issues in Tourism*, 24(3), 367–384.
- [4] Huang, S. (Sam), Shao, Y., Zeng, Y., Liu, X., & Li, Z. (2021). *Impacts of COVID-19 on Chinese nationals' tourism preferences*. *Tourism Management Perspectives*, 40, 100895.
- [5] Xia J., & Feng X. (2020). *The Impact of Novel Coronavirus Outbreak on Tourism Industry and the Countermeasures*. *China Business and Market*, 34(3), 3–10. <https://doi.org/10.14089/j.cnki.cn11-3664/f.2020.03.001>
- [6] Osti, L., & Nava, C. R. (2020). *LOYAL: TO WHAT EXTENT? A shift in destination preference due to the COVID-19 pandemic*. *Annals of Tourism Research Empirical Insights*, 1(1), 100004.
- [7] Li, H., Hu, M., & Li, G. (2020). *Forecasting tourism demand with multisource big data*. *Annals of Tourism Research*, 83, 102912.
- [8] Yang, T.-T., Ruan, W.-Q., Zhang, S.-N., & Li, Y.-Q. (2021). *The influence of the COVID-19 pandemic on tourism demand for destinations: An analysis of spatial heterogeneity from a multi-scale perspective*. *Asia Pacific Journal of Tourism Research*, 26(7), 793–810.
- [9] Wang Qingsheng, & Liu Shihan. (2020). *Impact of COVID-19 Epidemic Situation on the Travel Intention and Behavior of Domestic Tourists*. *Areal Research and Development*, 39(4), 1–5.
- [10] Abdullah, M., Dias, C., Muley, D., & Shahin, Md. (2020). *Exploring the impacts of COVID-19 on travel behavior and mode preferences*. *Transportation Research Interdisciplinary Perspectives*, 8, 100255.
- [11] Fan, X., Lu, J., Qiu, M., & Xiao, X. (2023). *Changes in travel behaviors and intentions during the COVID-19 pandemic and recovery period: A case study of China*. *Journal of Outdoor Recreation and Tourism*, 41, 100522.
- [12] Morar, C., Tiba, A., Basarin, B., Vujičić, M., Valjarević, A., Niemets, L., Gessert, A., Jovanovic, T., Drugas, M., Grama, V., Stupariu, M., Stoica, A., & Lukić, T. (2021). *Predictors of Changes in Travel Behavior during the COVID-19 Pandemic: The Role of Tourists' Personalities*. *International Journal of Environmental Research and Public Health*, 18(21), Article 21.
- [13] Ren xiaoming, & Luo baohua. (2003). *An analysis of Piaget's theory of behavior evolution*. *Journal of Southeast University (Philosophy and Social Science)*, 3, 46–50.
- [14] Jin C., Feng X. -, & Zhou C. (2017). *Study on Demand Characteristics and Experience Difference of Rural Tourists Using Web Text Mining Methods A Case Study of Shanghai City*. *Resource Development & Market*, 33(9), 1127–1133.
- [15] Delaere, I., Sutter, G. D., & Plevoets, K. (2012). *Is translated language more standardized than non-translated language? Using profile-based correspondence analysis for measuring linguistic distances between language varieties*. *Target. International Journal of Translation Studies*, 24(2), 203–224.