

Understanding the Impact of Destination Image and Infrastructure Quality on the Destination Loyalty in Luoyang City, China

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To Link this Article: <http://dx.doi.org/10.6007/IJARBS/v14-i10/23052> DOI:10.6007/IJARBS/v14-i10/23052

Published Date: 10 October 2024

Abstract

Tourism plays an essential role in China's economy and business landscape, the rise of tourism has also gradually become the focus of academic discussion. The purpose of this study is to examine the impact of destination image and infrastructure quality on destination loyalty in Luoyang City. Design/methodology/approach: This study used quantitative methods, it collects data from a small sample using focus groups, observations and individual interviews. We distributed questionnaires to domestic and foreign tourists who had visited Luoyang City and collected online questionnaires. A total of 520 valid responses were gathered using stratified sampling methods. The Statistical Package for Social Sciences (SPSS) was used to analyse the data. Findings: The results show that both infrastructure quality and destination image have a significant impact on destination loyalty in Luoyang City. Value: The results of this study provide a basis for decision-making for the tourism department of Luoyang Municipal Government, and a foundation for building a marketing model for travel agencies and other related enterprises, further improving the level of Luoyang City's tourism industry.

Keywords: Destination Image, Infrastructure Quality, Destination Loyalty, Luoyang City

Introduction

Tourism can stimulate social consumption, increase employment, drive the development of other industries, promote the optimization of the local economic structure, and has an obvious role in stimulating domestic demand. The World Economic Forum has identified environmental sustainability as a crucial component in its Travel & Tourism Competitiveness ranking, in which China was ranked 132nd out of 136 countries (J. Zhao & Li, 2018). In response, China has implemented measures such as the Forest Protection law to safeguard its natural and heritage, thereby ensuring a satisfactory experience for tourists and benefiting the local community. Luoyang City is rich in environmental resources, with national nature reserves such as Mount Funiu and peaks such as Mount Laojun, Mount Qingyao and Mount Tianchi. As a city rich in history and culture, Luoyang City is one of the birthplaces of the Chinese civilization, with a total of thirteen dynasties having their capitals in Luoyang, which

is why it is also known as the 'Ancient Capital of the Thirteen Dynasties'. Luoyang City is being widely studied as a popular tourist destination.

It is known from previous literature that tourist loyalty are becoming ambassadors for the destination, sharing their positive experiences and recommendations with others, thereby contributing to the destination's reputation and attractiveness (Yoon & Uysal, 2005). The importance of destination loyalty is also highlighted in studies that explore the relationship between tourist satisfaction and loyalty, with findings suggesting that tourists who are satisfied with their environment are more likely to develop a strong emotional attachment to the destination, thus increasing their destination loyalty. Urban destinations have a wider spatial scope and often contain multiple scenic destinations that are geographically dispersed and relatively distant. At the same time, urban destinations are both the daily life space for urban residents and also assume the function of tourism for tourists. Tourists face a more complex tourism environment when conducting urban tourism in urban destinations (Wenzhi W, 2021). In order to carry out tourism activities more smoothly, tourists demand more environmental factors such as destination image and infrastructure quality in urban destinations. Therefore, this paper aims to explore the influence of destination image and infrastructure quality on destination loyalty in Luoyang city in order to promote the development of tourism industry in Luoyang city.

Literature Review

In previous studies, the dependent variable is the outcome that the researcher aims to explain or predict. The dependent variable changes in response to the manipulation of independent variables, serving as the primary focus of statistical analysis and hypothesis testing (Field, 2018). In this context, the dependent variable is 'destination loyalty'. A positive and enjoyable experience during a visit can lead to a strong emotional attachment to the destination, increasing the likelihood of revisiting and recommending it to others (Prayag, 2009). Destination attributes such as environmental and cultural attractions, amenities, and other factors also play a key role in influencing tourists' decision to return. Similarly, a study by Yoon and Uysal (2005) found that satisfaction and destination image were significant predictors of destination loyalty. These studies highlight the importance of understanding the factors that influence tourist loyalty in order to develop effective marketing and management strategies to promote repeat visits and positive word-of-mouth.

Destination image is greatly influenced the tourist loyalty (Jamaludin et al., 2018). Attractive destination image is proven to be one of the environment factor to positively influence tourist satisfaction and destination loyalty in Indonesia (Aniqoh et al., 2022). And a study also revealed that destination image affected destination in Hong Kong (Lu et al., 2020). Besides, Yangzi P. (2024) proposed that the destination image of Henan province has a positive impact on the revisit intention of tourists.

The infrastructure quality significantly influences tourists' experiences and subsequently, their loyalty to a location. Infrastructure that is well-developed and properly maintained, encompassing transportation, accommodation, and other amenities, plays a crucial role in enhancing the overall satisfaction of tourists (Cuccllelli & Goffi, 2016). Optimal transit infrastructure guarantees convenient access and smooth navigation for tourists, while pleasant accommodation offer a calm and pleasurable trip. Moreover, the presence of

essential facilities, such as hygienic restrooms, informative centres, and visitor-oriented conveniences, amplifies the overall attractiveness of the location. Several empirical analyses have emphasised the significance of high-quality infrastructure in promoting and maintaining tourist loyalty. An example is a research carried out by Tsai (2016) in Taipei, which revealed that the presence of effective public transit and properly maintained amenities had a notable impact on visitors' contentment and their inclination to return to the city. In research conducted by Chen and Chen (2010) in Bali, it was shown that the condition of infrastructure, such as roads, accommodation, and tourist amenities, had a significant impact on tourists' opinions of the area and their inclination to visit again.

Several studies have demonstrated the positive relationship between destination cleanliness and tourist satisfaction and loyalty. However the study in Penang showed that cleanliness was not significantly affect destination loyalty (Shirazi et al., 2013). The influence of cleanliness might vary in different location due to the characteristic of the destination. Tourists who visit beach might have higher expectation of cleanliness than in a city-like environment. In other case, other concern such as security and safety is more important than cleanliness (Shukor et al., 2017). This is because the emotion of tourists is more stable when the destination is safe and secure causing higher destination loyalty (Patwardhan et al., 2020). Therefore, cleanliness was not included as an influencing factor in this study.

Methodology

A quantitative study uses analytical approaches that aim to prove, disprove, or lend acceptance to an existing theory. The utilisation of quantitative research will be more suitable as more generalizable findings will be achieved, as aforementioned by Onwuegbuzie et al. (2009).

A questionnaire survey, appropriate for cross-sectional methods, will serve as the primary instrument for data collection from the selected population at a single point in time. The sampling technique that will be utilized in this study is stratified sampling. Stratified sampling, a type of probability sampling method, is chosen due to its ability to ensure that specific subgroups of the population are adequately represented in the sample, thereby increasing the representativeness and generalizability of the research findings. The process begins with the identification of relevant stratifying variables which might include demographic factors like age, gender, income, nationality, or specific behavioural traits relevant to the study. These variables are chosen based on their relevance to the research question and their ability to segment the population into homogeneous subgroups (Singh and Masuku, 2014). The aim is to create strata where individuals within each group are similar to each other and different from those in other groups.

The sample size for this inquiry was obtained using the method of confidence interval estimation. The majority of marketing researchers and national opinion polling organisations frequently utilise this approach, making it a suitable option for performing this study (Burns & Bush, 2014). This technique is applied when the population is too large or unknowable, the sample size can be derived by computing the minimum sample size required for accuracy in estimating proportions by considering the standard normal deviation set at 95% confidence level (1.96), percentage picking a choice or response (50% = 0.5) and the confidence interval (0.05 = ± 5). The standard sample size formula by Burns and Bush (2014) is provided as follows:

$$\begin{aligned}
 n &= z^2 (p)(1-p) / e^2 \\
 &= 1.962(0.5) (1-0.5) / 0.052 \\
 &= 384.16 \\
 &\sim 385
 \end{aligned}$$

The population's variability in this study was large and indeterminate; hence it was approximated to a maximum of 50%. This assumption was established based on the anticipation of significant variations in sample answers. The initial sample size of 385 was augmented to accommodate for non-responses and non-useable data. Given that an onsite survey was suggested as the technique for data collection, it is anticipated that the response rate would be higher. Previous research indicates that response rates have varied between 57.4% and 86.9% (Prayag & Ryan, 2012; Naidoo & Ramseook-Munhurrin et al., 2015). Therefore, it is projected that the response rate for this survey will be about 70%. Consequently, it is necessary to include 20% of the non-response rate when determining the sample size. An additional 10% of the questions were classified as non-useable. Hence, the survey aimed to gather responses from a total sample size of 500, calculated by multiplying 385 by 1.3.

To examine the influence of the independent variables on destination loyalty, multiple regression analysis was employed by SPSS. This mathematical model, as described by Shi & Conrad (2009), reflects the relationships between the independent and dependent variables. The regression analysis involved several key steps. First, separate models were created for each group of factors (infrastructure quality and destination image) as independent variables, with destination loyalty as the dependent variable. The analysis then evaluated model fit using R-squared and adjusted R-squared values, conducted hypothesis testing of individual predictors using t-tests and their corresponding p-values, and examined standardized beta coefficients to compare the relative importance of different predictors.

Demographic Information

Table 1

Demographic Information of Respondents

		Count	Column N %
Education	Less than High School	3	0.6%
	High School	11	2.1%
	Some college, no degree	61	11.7%
	Diploma/A-Level	135	26.0%
	Bachelor's Degree	160	30.8%
	Master's Degree	105	20.2%
	PhD/Doctoral	45	8.7%
Gender	Male	281	54.0%
	Female	226	43.5%
	Non-binary	13	2.5%
	Other	0	0.0%
Occupation	Student	68	13.1%
	Employed (full-time)	147	28.3%
	Employed (part-time)	173	33.3%

	Self-employed	93	17.9%
	Unemployed	29	5.6%
	Retired	9	1.7%
	Homemaker	0	0.0%
	Other	1	0.2%
Income	Less than USD 420	16	3.1%
	USD 420-700	39	7.5%
	USD 700-980	69	13.3%
	USD 980-1400	116	22.3%
	USD 1400-2100	149	28.7%
	USD 2100-2800	81	15.6%
	USD 2800-3500	40	7.7%
	USD 3500 and more	10	1.9%

According to the table, majority of the respondents have a Bachelor's Degree at 30.8%. This is then followed by those having Diploma/A-Level certificates at 26%. 20.2% of the respondents possessed Master's Degree. Further, 11.7% of the respondents have gone to college but do not have any degree. This was then followed by Doctoral certificates at 8.7% and High school certificate at 2.1%. Lastly, only 0.6% of the respondents had less than a High school certificate. This means that majority of the respondents interested in tourist destinations have higher qualifications, with most of them having Degree. The data indicates that the majority of tourists visiting Luoyang City possess higher educational qualifications, with 30.8% holding a Bachelor's Degree and a substantial proportion having Diploma/A-Level certificates (26%) and Master's Degrees (20.2%).

Secondly, based on gender, 54% of the respondents were males, 43.5% females and only 2.5% were Non-binary. The above representation means that most of the people interested in tourist destination sites are males followed by females. out of the respondents 54% were male while 43.5% were female. To a certain extent, the gender distribution shows 5% female and reveals a stronger focus on tourism among males in this sample.

On occupation, 33.3% of the respondents were employed part-time, which gave them the opportunity to frequently visit the tourist destination sites. This reflects on the high percentage of this group visiting tourist destination sites because they have more free time. This is then followed by the employed respondents at 28.3% participating in the study. Self-employed respondents occupied 17.9% of the whole sample participating in the study, followed by 13.1% being students. Only 5.6% were unemployed and 1.7% being retired. he occupation distribution shows that a significant portion of the respondents are part-time employed (33.3%) and full-time employed (28.3%), followed by self-employed individuals (17.9%) and students (13.1%).

Lastly, based on income, the majority of the respondents earned between USD 1400-2100, which was shown by 28.7%. Secondly, 22.3% of the respondents earned between USD 980-1400, followed by 13.3% earning between USD 700-980. Further, 15.6% earned between USD 2100-2800 while 7.5% of the respondents were earning between USD 420-700. 3.1% earned less than USD 420 while 1.9% earned USD 3500 and more. Based on the information given,

the majority of the respondents interested in tourist destination sites, especially Luoyang City, fall within the middle- and upper-middle-class social groups. This is shown by the amount of income the respondents receive, where more people visiting the city earn moderate to high amounts of income. The majority of respondents fall within the middle- and upper-middle-class income brackets, with 28.7% earning between USD 1400-2100 and 22.3% earning between USD 980-1400.

Reliability and Validity

Table 2 presents the reliability and validity measures for all constructs used in this study. Destination image and infrastructure quality Both showed very good reliability with Cronbach's Alpha values of .913 and .902, and Composite Reliability values of .888 and .917 respectively. These values exceed the recommended thresholds suggested by Nunnally and Bernstein (1994) and Hair et al. (2010), indicating robust measurement consistency for these constructs. These findings align with similar research in the tourism field. For instance, Kim et al. (2015) reported Cronbach's Alpha values ranging from 0.87 to 0.93 for environmental factors in their study on destination attributes, supporting the high reliability observed in our study. Similarly, Ramseook-Munhurrun et al. (2015) found Cronbach's Alpha values between 0.71 and 0.90 for destination image. Overall, the reliability analysis indicates that most constructs in this study demonstrate good to excellent internal consistency and reliability.

Table 2

Reliability and Validity Measures

Construct	Number of Items	Cronbach's Alpha	Composite Reliability
Destination image	9	.913	.888
Infrastructure Quality	8	.902	.917
DESTINATION LOYALTY	7	.879	.944

Correlation Analysis

The findings reveal that environmental factors, specifically destination image and infrastructure quality, significantly influence destination loyalty. The Model Summary shows a high R-squared value of 0.803, indicating that 80.3% of the variance in destination loyalty can be explained by these two predictors. The Adjusted R Square of 0.802 confirms the model's robustness.

Table 3

Model summary of environmental factors towards destination loyalty

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.896 ^a	.803	.802	.39264

a. Predictors: (Constant), Infrastructure_Quality, Destination_image

The ANOVA table supports the model's statistical significance, with a very high F-value of 1051.342 and a p-value (Sig.) of 0.000, indicating that the overall model is highly significant.

Table 4

ANOVA of infrastructure quality and destination image toward destination loyalty

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	324.161	2	162.081	1051.342	.000 ^b
	Residual	79.704	517	.154		
	Total	403.865	519			

a. Dependent Variable: DESTINATION_LOYALTY

b. Predictors: (Constant), Infrastructure_Quality, Destination_Image

The Coefficients table shows that both destination image ($\beta = 0.385$, $p = 0.000$) and infrastructure quality ($\beta = 0.558$, $p = 0.000$) have positive and statistically significant effects on destination loyalty. The infrastructure quality has a stronger influence, as indicated by its higher standardized beta coefficient. In conclusion, improving the destination image and infrastructure quality can lead to higher destination loyalty, with infrastructure playing a more critical role.

Table 5

Coefficient table of environmental factors towards destination loyalty

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.225	.065		3.449	.001
	Destination_Image	.368	.031	.385	11.846	.000
	Infrastructure_Quality	.557	.032	.558	17.186	.000

a. Dependent Variable: DESTINATION_LOYALTY

Therefore, both the destination image and the infrastructure quality have a positive and significant impact on the destination loyalty.

Conclusion

This study revealed that destination image and infrastructure quality are statistically related with destination loyalty in Luoyang City, this indicated that these environmental factors are the most influential in total explanation of tourists' experience and their tendency to re-visit the destination (Barkah & Febriasari, 2021). Tourist destination loyalty which is associated to the extent that a tourist intends to travel to the same destination or even recommend it to others is affected by many factors although image of the destination or the physical facility infrastructure within the destination organization is most influential.

The positive implications of environmental factors(destination image and infrastructure quality) for satisfaction extend previous theories on Environmental Quality and Sustainable Tourism. They are important because the destination image, infrastructure quality, naturalness and sustainability frequencies influence the tourists experiences. Thus, this

theoretical contribution highlights the importance of destination environmental quality as a way of improving tourist satisfaction.

These results underscore the need to continue to develop and strengthen both the image of the destination as well as the physical environment in order to increase the level of loyalty among the tourists. In the case of Luoyang City, promoting infrastructural development alongside persistent image marketing would go a long way into building a strong base for demand since the tourists not only visit, but also encourage others to follow. In this respect, this approach is essential for the sustainable and further development of tourism business in Luoyang City. Through such concepts' incorporation into the tourism framework, Luoyang City is geared to attract customers having a desire to accommodate sustainable practices, satisfy them, and ultimately expect a repeat. Moreover, increasing awareness of green certification and sustainable measures are likely to boost the destination image as a green destination, thus attracting the conscious tourists' market.

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