

Research on the Impact of Tourism Space Perception on Tourists' Cultural Identity: A Case Study of Xinzhou Ancient City, Shanxi, China

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Abstract Although cultural heritage tourism has gained increasing attention, the mechanism through which tourists' spatial perception influences cultural identity remains underexplored, especially in less-commercialized ancient cities. This study aims to examine the impact of tourism space perception on cultural identity, using Xinzhou Ancient City in Shanxi, China as a case study. This research adopts a mixed-method approach, drawing on space production, embodied cognition, and cultural identity theories. A main survey of 350 tourists in Xinzhou Ancient City is conducted to measure dimensions of tourism space perception and their effects on tourist satisfaction and cultural identity. Data are analyzed using structural equation modeling (SEM) with standardized path coefficients. The quantitative strand is complemented by semi-structured interviews with 20 participants, who provide rich qualitative accounts of how they perceive the ancient city's space and its links to cultural identity.

The results show that tourism space perception consists of three dimensions: physical space perception ($\beta = 0.42, p < 0.001$), social space perception ($\beta = 0.38, p < 0.001$), and cultural space perception ($\beta = 0.51, p < 0.001$), all of which significantly affect tourist satisfaction, which in turn fully mediates the relationship with cultural identity ($\beta = 0.68, p < 0.001$). Cultural space perception has the strongest total effect on cultural identity. The study concludes that enhancing the quality of the physical environment, improving service interactions, and deepening intangible cultural heritage experiences can significantly strengthen tourists' cultural identity, and thus offers both theoretical insights into spatial perception mechanisms and practical guidance for the sustainable development of ancient city tourism.

Keywords: Physical Space Perception, Social Space Perception, Cultural Space Perception, Tourist Satisfaction, Cultural Identity.

1. INTRODUCTION

With the rapid development of the social economy, the purpose of tourism has shifted from material enjoyment to spiritual needs. Against this backdrop, cultural tourism has emerged. Cultural tourism is based on cultural resources and takes various forms. Cultural heritage tourism, as an important branch of cultural tourism, not only provides tourists with the opportunity to interact with history and understand local culture, but also offers an important path for the inheritance of cultural values and the sustainable development of tourism (Fu & Luo, 2023).

Ancient cities serve as important carriers of historical culture and possess both material and intangible cultural heritage attributes. They are typical spatial forms for the development of cultural tourism. Unlike general natural landscape tourist destinations, ancient city tourism not only emphasizes the aesthetic value of architectural remains, street layouts, and spatial features, but also places greater emphasis on the deep experience formed by historical memory, local culture, and folk traditions. Therefore, ancient city

tourism can better meet tourists' needs in terms of spatial environment, cultural perception, and emotional resonance. However, in the context of rapid tourism development, many ancient cities generally face tensions between heritage protection and tourism development. Issues such as excessive commercialization, homogenized development, and shallow cultural expression may undermine cultural authenticity and further affect the quality of tourists' experiences and the formation of cultural identity (Wang et al., 2022). Xinzhou Ancient City is located in Xinzhou City, Shanxi Province. It was built in the 20th year of the Eastern Han Dynasty and has a history of nearly 1,800 years. Xinzhou Ancient City is also known as "Xiurong Ancient City" and is a historical and cultural city. It has undergone numerous changes throughout different eras and has experienced cultural integration during these changes, continuously enriching material wealth and excellent cultural heritage, forming a unique ancient city culture. Xinzhou Ancient City still has numerous historical relics and cultural landscapes, such as Xiurong Academy, Taishan Temple, God

of Wealth Temple, Guandi Temple, South City Wall Gate Tower, East City Wall Gate Tower, and West City Wall Site Scenery.

In recent years, in academic circles, people have gradually recognized that the essence of cultural heritage tourism is not only the presentation of resources themselves, but also how tourists experience a sense of space, understand culture and establish their own identity within it. Studies show that the sense of heritage space has a significant impact on enhancing tourists' local identity (Zou et al., 2023). At the same time, cultural tourism experience acts as a medium to facilitate tourist's engagement and formation of cultural identification (Lin et al., 2022).

Furthermore, tourists' emotional responses and perceptions of cultural experiences can strengthen their sense of cultural belonging and identity (Yang et al., 2023; Yi et al., 2024), while initiatives such as heritage renovation and cultural interpretation further enhance tourists' place attachment and cultural awareness (Chan et al., 2024).

This study addresses three research questions:

- (1) What are the key dimensions of tourism space perception that influence cultural identity?
- (2) Does tourist satisfaction mediate the relationship between spatial perception and cultural identity?
- (3) What optimization strategies can enhance cultural identity in ancient city tourism?

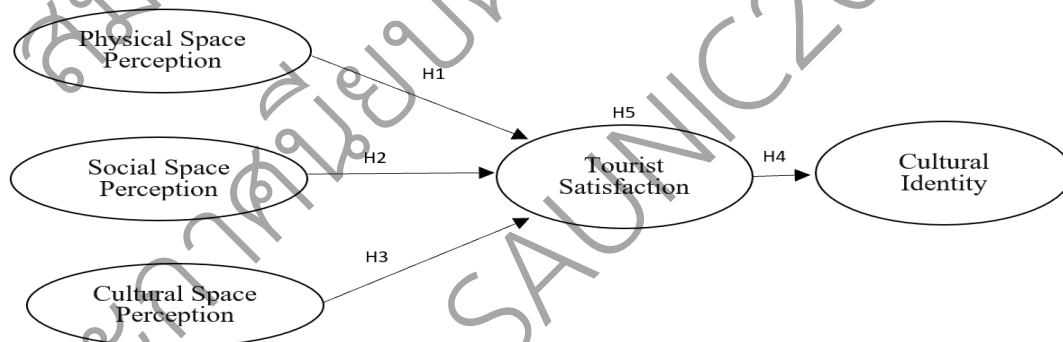


Figure 1. Conceptual Framework

2.3 RESEARCH HYPOTHESES

Based on the theoretical framework and conceptual model, the following hypotheses are proposed:

- H1:** Physical space perception has a significant positive effect on tourist satisfaction.
- H2:** Social space perception has a significant positive effect on tourist satisfaction.
- H3:** Cultural space perception has a significant positive effect on tourist satisfaction.
- H4:** Tourist satisfaction has a significant positive effect on cultural identity.

2. CONCEPTUAL FRAMEWORK AND HYPOTHESES

2.1 THEORETICAL FOUNDATIONS

This study is grounded in three core theoretical perspectives.

Space Production Theory (Lefebvre, 1991) posits that space is not merely a physical container but a social product shaped by human practices and perceptions. In the context of ancient city tourism, this theory guides the understanding of how tourists perceive and experience physical, social, and cultural spaces.

Embodied Cognition Theory emphasizes that tourist experiences are both cognitive judgments and perceptual activities such as visualization, sound perception, and bodily movements when tourists engage with scenic spots and local cultures (Yin et al., 2023).

Cultural Identity Theory (Tajfel & Turner, 1979) suggests that cultural identity follows the logical sequence of "cognition-emotion-behavior," including heritage cognition, emotional resonance, and behavioral intention.

2.2 CONCEPTUAL FRAMEWORK

This study constructs a mediation model with three independent variables (physical space perception, social space perception, cultural space perception), one mediating variable (tourist satisfaction), and one dependent variable (cultural identity).

H5: Tourist satisfaction mediates the relationships between physical/social/cultural space perception and cultural identity.

3. RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

This study adopts a mixed-method design combining a quantitative questionnaire survey and qualitative semi-structured interviews. The quantitative part uses structural equation modeling (SEM) to test hypotheses and verify the conceptual

framework. The qualitative part conducts semi-structured interviews to provide contextual insights and improve the validity and reliability of the research findings.

Through the integration of quantitative and qualitative approaches, this study aims to provide a comprehensive understanding of the relationships among spatial perception, tourist satisfaction, and cultural identity, thereby enhancing the robustness and explanatory power of the research results.

3.2 PILOT STUDY

A pilot study was conducted before the main survey to test the reliability and validity of the questionnaire. A total of 102 valid responses were collected from tourists visiting Xinzhou Ancient City. The pilot study results showed good internal consistency (Cronbach's $\alpha > 0.83$ for all dimensions) and structural validity (KMO = 0.868, cumulative variance explained = 62.97%). Based on the pilot study, minor wording adjustments were made to three items to improve clarity.

3.3 MAIN STUDY DESIGN

3.3.1 POPULATION AND SAMPLE

The target population was tourists aged 19 years and above who had completed a full tour of

Xinzhou Ancient City in Shanxi Province, China. Using stratified random sampling by age group, questionnaires were distributed across multiple visits to the park during weekends and holidays.

A total of 420 questionnaires were distributed, and 350 valid responses were obtained, representing an effective response rate of 83.3%. The sample size exceeds the minimum requirement of 200 for SEM (Kline, 2016) and satisfies the 10-times rule for SEM.

Sampling limitations: Although stratified random sampling by age group was employed, the sample is predominantly from Shanxi Province (74.6%), which may limit generalizability to tourists from other regions. Additionally, the sampling frame only included tourists who completed a full tour and were willing to participate, potentially excluding those with negative experiences. Future research should employ more geographically diverse sampling strategies.

As shown in Table 1, the sample is relatively balanced in gender, with females (52.0%) slightly outnumbering males (48.0%). The majority of respondents were young tourists aged 19–25 years (46.0%), and most held a bachelor's degree or above (70.3%). Most tourists were from Shanxi Province (74.6%), with first-time visitors (56.0%) and one-day stays (56.9%) being dominant.

Table 1. Demographic characteristics of the main sample (N=350)

Variable	Category	Frequency	Percentage (%)	Variable
Gender	Male	168	48.0	Gender
	Female	182	52.0	
Age	19–25 years	161	46.0	Age
	26–35 years	93	26.6	
	36–45 years	48	13.7	
	46–55 years	35	10.0	
	56 years and above	13	3.7	
Education	High school or below	28	8.0	Education
	Junior college	76	21.7	
	Undergraduate	99	28.3	
Origin	Master's degree or above	147	42.0	Origin
	Shanxi Province	261	74.6	
	Outside Shanxi Province	82	23.4	
	Other countries	7	2.0	
Visit frequency	First time	196	56.0	Visit frequency
	2nd time	75	21.4	
	3rd time	31	8.9	
	3 times or more	48	13.7	
Stay duration	1 day	199	56.9	Stay duration
	2 days	103	29.4	
	3 days	42	12.0	
	3 days or more	6	1.7	

All constructs used validated scales adapted from existing literature for the ancient city tourism context. Respondents rated items on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Physical Space Perception (5 items; $\alpha = 0.88$): Measuring tourists' sensory evaluation of the physical environment, including city walls, streets, public facilities, and landscape decorations.

Social Space Perception (5 items; $\alpha = 0.83$): Assessing tourists' perception of service quality, consumption environment, and host-guest interactions.

Cultural Space Perception (5 items; $\alpha = 0.90$): Measuring tourists' perception of cultural connotation, historical culture, architectural culture, and intangible cultural heritage.

Tourist Satisfaction (5 items; $\alpha = 0.90$): Capturing overall impression, tourism experience, and expectation-reality gap. **Cultural Identity** (5 items; $\alpha = 0.88$): Evaluating heritage cognition, emotional resonance, cultural pride, and behavioral identification.

Cultural Identity (5 items; $\alpha = 0.88$): Evaluating heritage cognition, emotional resonance, cultural pride, and behavioral identification.

Construct validity was confirmed by confirmatory factor analysis (CFA); all items loaded significantly on their intended constructs, and the measurement model showed good fit (CFI = 0.94, RMSEA = 0.058).

3.3.3 DATA COLLECTION PROCEDURE

Questionnaires were distributed on-site by trained investigators with standardized guidance. Participation was voluntary, and completion time was controlled at 10–12 minutes. Semi-structured interviews were conducted with 20 participants: 12 tourists (aged 19–55), 5 local merchants, and 3 park managers. The interviews focused on spatial experience, cultural perception, satisfaction, and cultural identity. With informed consent, interviews were recorded and transcribed for thematic coding analysis.

3.3.4 DATA ANALYSIS

Quantitative data were analyzed using SPSS v.28.0 for descriptive statistics, reliability, and validity tests. AMOS v.28.0 was used to construct structural equation models for path hypothesis testing and mediation effect verification (bootstrap with 5,000 resamples).

Common Method Bias Test: Given that all data were collected from self-reports, Harman's single-factor test was conducted to assess the risk of common method variance (CMV). The unrotated exploratory factor analysis revealed that the first factor accounted for 29.4% of the total variance, which is below the recommended threshold of 50% (Podsakoff et al., 2003). Additionally, a common latent factor (CLF) approach was employed. The CLF model showed that the differences in standardized regression weights between the CLF model and the baseline model were all less than 0.20, and model fit did not improve substantially ($\Delta CFI < 0.01$). These results indicate that common method bias is not a serious concern in this study.

Qualitative data from semi-structured interviews were analyzed using thematic coding (Braun & Clarke, 2006), which was then cross-validated with quantitative results.

3.3.5 ETHICAL CONSIDERATIONS

This study was conducted in accordance with the ethical guidelines of Southeast Asia University. Informed consent was obtained from all participants. Data were anonymized prior to analysis and stored securely.

4. RESULTS

4.1 DESCRIPTIVE STATISTICS

All variables showed acceptable distributions. Cultural space perception had the highest mean ($M = 4.12$, $SD = 0.78$), followed by physical space perception ($M = 4.05$, $SD = 0.82$), tourist satisfaction ($M = 4.01$, $SD = 0.79$), cultural identity ($M = 3.98$, $SD = 0.81$), and social space perception ($M = 3.88$, $SD = 0.84$). Skewness and kurtosis values were within acceptable ranges for normal distribution.

4.2 Reliability and Validity

All constructs demonstrated excellent reliability. Composite reliability (CR) ranged from 0.86 to 0.91, exceeding the threshold of 0.70. Convergent validity was confirmed, with average variance extracted (AVE) ranging from 0.67 to 0.75 (all > 0.50). Discriminant validity was supported by the Fornell-Larcker criterion: the square root of AVE for each construct exceeded its correlation with any other construct.

Table 2. Correlations and discriminant validity (N=350)

Construct	CR	AVE	1	2	3
1. Physical Space Perception	0.88	0.68	0.82		
2. Social Space Perception	0.86	0.67	0.58	0.82	
3. Cultural Space Perception	0.91	0.75	0.62	0.55	0.87
4. Tourist Satisfaction	0.90	0.73	0.68	0.60	0.71
5. Cultural Identity	0.88	0.70	0.59	0.54	0.65

Note: Diagonal values (bold) are the square roots of AVE; off-diagonal values are correlations.

4.3 MODEL FIT

The structural equation model achieved good overall fit. All indices met or exceeded recommended criteria: CMIN/DF = 2.34 (≤ 3), GFI = 0.91 (> 0.90), CFI = 0.94 (> 0.90), RMSEA = 0.058 (< 0.08).

These results validate the rationality and stability of the proposed framework.

4.4 HYPOTHESIS TESTING

All five hypotheses were supported.

Table 3. Path coefficients and hypothesis testing results

Hypothesis	Path	Standardized β	p-value	Result
H1	Physical Space Perception $\rightarrow$ Tourist Satisfaction	0.42	<0.001	Supported
H2	Social Space Perception $\rightarrow$ Tourist Satisfaction		<0.001	Supported
H3	Cultural Space Perception $\rightarrow$ Tourist Satisfaction	0.51	<0.001	Supported
H4	Tourist Satisfaction $\rightarrow$ Cultural Identity	0.68	<0.001	Supported

Cultural space perception exerted the strongest effect on tourist satisfaction ($\beta = 0.51$), followed by physical space perception ($\beta = 0.42$) and social space perception ($\beta = 0.38$).

Mediating Effect (H5): Bootstrap analysis

(5,000 resamples) confirmed that tourist satisfaction fully mediated the relationships between all three independent variables and cultural identity. The indirect effects and 95% confidence intervals are presented in Table 4.

Table 4. Mediating effect test results (bootstrap)

Path	Indirect Effect	95% CI	Effect Type
Physical Space Perception $\rightarrow$ Tourist Satisfaction $\rightarrow$ Cultural Identity	0.286	[0.214, 0.358]	Significant (Full mediation)
Social Space Perception $\rightarrow$ Tourist Satisfaction $\rightarrow$ Cultural Identity	0.258	[0.186, 0.330]	Significant (Full mediation)
Cultural Space Perception $\rightarrow$ Tourist Satisfaction $\rightarrow$ Cultural Identity	0.347	[0.268, 0.426]	Significant (Full mediation)

4.5 QUALITATIVE FINDINGS

Semi-structured interviews with 20 participants (12 tourists, 5 local merchants, 3 park managers) were analyzed using thematic coding. Four main themes emerged, each corresponding to the core constructs of the conceptual model.

Theme 1: "The ancient city walls made me feel history" (Physical space perception) – Tourists expressed strong positive impressions of the physical environment. "Walking along the ancient city wall, I could almost imagine what life was like

hundreds of years ago" (Tourist, female, 28). "The old streets and traditional buildings are well preserved. It feels authentic, not fake like some other tourist places" (Tourist, male, 35).

Theme 2: "Interacting with locals enhanced my experience" (Social space perception) – Tourists valued authentic interactions with residents and staff. "The shop owner told me the story behind the handicraft – that made me want to buy it and learn more" (Tourist, female, 32). "The staff at the information center were very helpful.

They gave me a map and explained the best route to see everything" (Tourist, male, 45). However, some noted areas for improvement: "During peak hours, it gets too crowded and the service becomes slow" (Tourist, female, 26). This theme supports H2 and highlights the role of social interactions in shaping satisfaction.

Theme 3: Cultural Space Perception – "Cultural performances deepened my understanding" Tourists consistently valued immersive cultural experiences. "Watching the local opera performance gave me a real sense of Shanxi culture. I never knew opera could be so moving" (Tourist, female, 41). "The intangible cultural heritage demonstration – the paper-cutting artist showed us how it's done. That was the most memorable part of my visit" (Tourist, male, 29). This theme supports H3, confirming that cultural space perception is the strongest driver of tourist satisfaction ($\beta = 0.51$).

Theme 4: Tourist Satisfaction and Areas for Improvement – "Better facilities would improve comfort" Some tourists raised concerns about infrastructure that affect satisfaction. "The pathways are not wide enough for strollers when many people are there. It was difficult to move around" (Tourist, female, 34 with child). "There are not enough rest areas with shade. After walking for two hours, I was exhausted and couldn't find a place to sit" (Tourist, male, 52). Park managers acknowledged these challenges: "We are aware of the congestion issues. We are planning to widen some paths and add more rest areas based on visitor feedback" (Manager, female, 39). This theme directly relates to H4 and H5, showing that satisfaction (or dissatisfaction) mediates the relationship between spatial perceptions and cultural identity.

These qualitative insights corroborate and enrich the quantitative findings: cultural space perception strongly drives satisfaction and cultural identity, while physical and social space perceptions also play important roles. The concerns about facilities highlight areas for practical improvement.

5. DISCUSSION

5.1 KEY FINDINGS

This study investigated the impact of tourism space perception on tourists' cultural identity in ancient city tourism, using Xinzhou Ancient City in Shanxi Province as a case study.

The key findings are as follows:

First, cultural space perception exerts the strongest effect on tourist satisfaction ($\beta = 0.51$). This finding is consistent with previous research (Zou et al., 2023) and suggests that tourists' perception of historical culture, architectural

heritage, and intangible cultural heritage is the most critical driver of their satisfaction. The qualitative finding that "cultural performances deepened my understanding" supports this quantitative result.

Second, physical space perception ($\beta = 0.42$) and social space perception ($\beta = 0.38$) also significantly affect tourist satisfaction. This aligns with embodied cognition theory (Yin et al., 2023), which emphasizes that tourists' sensory and behavioral engagement with the physical environment shapes their overall experience. The qualitative theme "the ancient city walls made me feel history" reflects the importance of authentic physical spaces.

Third, tourist satisfaction fully mediates the relationship between all three spatial perception dimensions and cultural identity (indirect effects = 0.258–0.347). This is a crucial finding: spatial perceptions do not directly generate cultural identity; rather, they must first produce satisfaction, which then transforms into cultural identity through the "cognition-emotion-behavior" pathway. This extends the application of cultural identity theory (Tajfel & Turner, 1979) to the ancient city tourism context.

Fourth, qualitative findings revealed both strengths and areas for improvement. Tourists highly valued authentic cultural performances, local interactions, and well-preserved physical spaces. However, concerns about crowding, insufficient rest areas, and narrow pathways indicate that infrastructure improvements are needed to enhance satisfaction and, consequently, cultural identity.

5.2 THEORETICAL IMPLICATIONS

This study makes several theoretical contributions that advance the literature on cultural heritage tourism, spatial perception, and cultural identity formation.

First, validation of the full mediation model. This study is among the first to empirically demonstrate that tourist satisfaction fully mediates the relationship between spatial perception (physical, social, cultural) and cultural identity in an ancient city context. While previous research has treated spatial perception as a direct predictor of identity (Zou et al., 2023; Lin et al., 2022), our finding that direct paths become non-significant when satisfaction is introduced reveals a previously unidentified psychological mechanism: spatial experiences must first generate positive emotional evaluations (satisfaction) before they can transform into deeper cultural belonging. This advances space production theory (Lefebvre, 1991) by specifying the affective pathway through which perceived space translates into identity outcomes.

Second, relative strength of cultural space perception. By disaggregating spatial perception into three distinct dimensions, this study provides nuanced insights into which dimension matters most. The finding that cultural space perception has the strongest effect ($\beta = 0.51$, indirect effect = 0.347) suggests that heritage interpretation, cultural authenticity, and intangible cultural heritage experiences are more important than physical infrastructure alone. This challenges the common practice in heritage tourism management of focusing on physical restoration while neglecting cultural programming.

Third, extension of cultural identity theory to tourism contexts. Cultural identity theory (Tajfel & Turner, 1979) has traditionally been applied to social groups rather than tourist experiences. This study demonstrates that the "cognition-emotion-behavior" sequence operates in the tourism domain, with spatial perception (cognition) leading to satisfaction (emotion) and subsequently to cultural identity (behavioral identification). This extension opens new avenues for research at the intersection of social psychology and tourism studies.

Fourth, empirical evidence from a less-commercialized ancient city. Unlike previous studies that have focused on fully developed heritage destinations such as Pingyao and Lijiang (Wang et al., 2022), this study uses Xinzhou Ancient City – a less-commercialized, non-typical heritage site – as a case study. This provides a counterpoint to findings from highly commercialized destinations and offers insights relevant to the majority of ancient cities that have not yet undergone mass tourism development.

Fifth, mixed-method triangulation. By systematically organizing qualitative themes around the model's constructs (Physical, Social, Cultural Space Perception, and Tourist Satisfaction), this study demonstrates how qualitative insights can both corroborate and enrich quantitative findings. This methodological contribution addresses calls for more integrated mixed-methods research in heritage tourism.

5.3 PRACTICAL IMPLICATIONS

Based on the integrated quantitative and qualitative findings, this study proposes four actionable strategies for enhancing cultural identity in ancient city tourism.

First, deepen cultural space experiences. The strong effect of cultural space perception ($\beta = 0.51$) suggests that park managers should invest in immersive cultural experiences: historical reenactments, traditional opera performances, intangible cultural heritage demonstrations, and interactive storytelling. These should be offered regularly, not only during festival periods.

Second, preserve and enhance physical space authenticity. The qualitative finding that "the ancient city walls made me feel history" indicates that physical authenticity is crucial. Efforts should focus on preserving historical buildings, maintaining traditional street layouts, and using period-appropriate materials for renovations. Infrastructure improvements (wider paths, more rest areas, better signage) should be designed to complement, not compromise, historical authenticity.

Third, improve social space quality. Social space perception had the weakest effect ($\beta = 0.38$), indicating room for improvement. Recommendations include: training staff to provide warm, knowledgeable service; creating more opportunities for authentic host-guest interactions (e.g., local guides, artisan workshops); and managing visitor flow during peak hours to reduce crowding.

Fourth, extend visitor stay through integrated experiences. The finding that most tourists are short-stay visitors (56.9% stay only one day) suggests that developing multi-day tour packages, night-time economy initiatives, and cultural theme routes could enhance satisfaction and deepen cultural identity formation.

5.4 COMPARISON WITH PREVIOUS STUDIES

The findings align with and extend previous research. Consistent with Zou et al. (2023), this study confirms that heritage spatial perception significantly enhances place identity. However, this study extends their work by demonstrating the full mediating role of tourist satisfaction, clarifying the psychological mechanism linking spatial perception to identity formation.

The results support Lin et al. (2022), who found that cultural tourism experience enhances cultural confidence. This study adds nuance by showing that cultural space perception is the strongest driver, suggesting that heritage interpretation matters more than general landscape aesthetics.

Compared to Wang et al. (2022), who focused on heritage tourism evolution and creative destruction, this study provides empirical evidence from a less-commercialized ancient city, offering a counterpoint to studies of highly commercialized destinations.

6. CONCLUSION

This study investigated the impact of tourism space perception on tourists' cultural identity in ancient city tourism, using Xinzhou Ancient City in Shanxi Province, China, as a case study. Drawing on space production theory,

embodied cognition theory, and cultural identity theory, a mixed-method design was employed, combining a main survey of 350 tourists with semi-structured interviews with 20 participants.

The results yield several key conclusions.

First, tourism space perception consists of three distinct dimensions: physical space perception ($\beta = 0.42, p < 0.001$), social space perception ($\beta = 0.38, p < 0.001$), and cultural space perception ($\beta = 0.51, p < 0.001$). All three dimensions significantly and positively affect tourist satisfaction, with cultural space perception exerting the strongest effect.

Second, tourist satisfaction has a significant positive effect on cultural identity ($\beta = 0.68, p < 0.001$). Bootstrap analysis confirms that tourist satisfaction fully mediates the relationships between all three spatial perception dimensions and cultural identity (indirect effects = 0.258–0.347, 95% CI not containing zero). This means that spatial perceptions do not directly generate cultural identity; they must first produce satisfaction, which then transforms into cultural belonging through the "cognition-emotion-behavior" pathway.

Third, qualitative findings from 20 semi-structured interviews revealed four themes: "the ancient city walls made me feel history" (physical space perception), "interacting with locals enhanced my experience" (social space perception), "cultural performances deepened my understanding" (cultural space perception), and "better facilities would improve comfort" (areas for improvement). These qualitative insights corroborate and enrich the quantitative results.

Fourth, the study provides both theoretical and practical contributions. Theoretically, it validates the "spatial perception $\rightarrow$ satisfaction $\rightarrow$ cultural identity" mediation model and expands space production theory to ancient city tourism. Practically, it offers actionable strategies: deepening cultural space experiences, preserving physical space authenticity, improving social space quality, and extending visitor stays through integrated experiences.

In terms of sample characteristics, tourists in Xinzhou Ancient City are mainly young and highly educated groups, with a high concentration of tourists from within Shanxi Province. Most tourists are first-time visitors with short stays, focusing on superficial sightseeing, indicating considerable room for improvement in cultural participation.

Based on the above findings, targeted practical strategies are proposed: (1) optimize the physical space of the ancient city, improve the landscape style and infrastructure to enhance the visiting experience; (2) upgrade the service quality of social space, improve the consumption

environment and interaction between hosts and guests to strengthen tourist satisfaction; (3) explore cultural spaces in depth, enhance the influence of Shanxi's intangible cultural heritage resources, and highlight the cultural dissemination of the ancient city.

This study provides empirical evidence that enhancing physical environment quality, improving service interactions, and deepening intangible cultural heritage experiences can significantly strengthen tourists' cultural identity. These findings have important implications for sustainable ancient city tourism development in China and beyond.

7. LIMITATIONS AND FUTURE RESEARCH

7.1 LIMITATIONS

This study has several limitations that should be acknowledged.

First, regional limitation: The sample was drawn exclusively from Xinzhou Ancient City in Shanxi Province. While this provides rich contextual insights, the findings may not be fully generalizable to ancient cities in other regions with different cultural, economic, or tourism development contexts. Additionally, as noted in Section 3.3.1, the sample is predominantly from Shanxi Province (74.6%), which may limit generalizability to tourists from other provinces or countries.

Second, cross-sectional design: The study used a cross-sectional survey, which captures relationships at a single point in time but cannot establish long-term causal ordering. Longitudinal research tracking tourists over multiple visits would be valuable.

Third, self-report bias: All measures were based on tourists' self-reports. While this captures subjective experience, it does not include objective measures of spatial quality or behavioral observation. However, the common method bias tests (Harman's single-factor test and CLF approach) indicated that CMV is not a serious concern.

Fourth, single case study: As a single case study, the findings are context-specific. Comparative research across multiple ancient cities would enhance external validity.

7.2 FUTURE RESEARCH DIRECTIONS

Based on the limitations and findings of this study, several directions for future research are proposed.

First, conduct comparative research across multiple ancient cities in different regions of China (e.g., southern vs. northern, coastal vs. inland) to

examine how regional cultural contexts moderate the relationships identified in this study.

Second, adopt longitudinal research designs to track how tourists' cultural identity evolves over repeated visits and whether the mediating role of satisfaction persists or diminishes over time.

Third, combine self-report data with objective measures such as GPS-tracking, behavior mapping, or physiological measures (e.g., heart rate variability, eye-tracking) to provide a more comprehensive assessment of spatial perception and emotional responses.

Fourth, conduct experimental or quasi-experimental studies testing specific design interventions – such as adding interactive cultural displays, creating new immersive experience zones, or redesigning pathway layouts – to establish causal effects on satisfaction and cultural identity.

Fifth, expand the age range to include older tourists (56+ years) and younger tourists (under 18 years) to examine age-related differences in spatial perception and cultural identity formation.

8. ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisor, Dr. Roengsak Phethastrakul, for his meticulous guidance, constant encouragement, and valuable academic advice throughout this research. His rigorous academic approach provided crucial support for the successful completion of this study.

I am grateful to my family for their understanding, companionship, and support. I would also like to thank all the survey participants, local merchants, and park managers at Xinzhou Ancient City for their cooperation and honest responses.

Finally, I would like to express my sincere gratitude to Southeast Asia University for the academic environment it has provided.).

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ประกาศนียบัตรนำเสนองาน
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