Library Progress International
Vol.44 No.3, Jul-Dec 2024: P. 29139-29161

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article

Available online at www.bpasjournals.com

Determinants of Cultural Heritage Protection Behavior Among Generation Y Tourists: A Case Study of Heritage Tourism in Shandong, China

Ge Kong[1], Nutteera Phakdeephirot[1], Songyu Jiang[1],

[1]Rattanakosin International College of Creative Entrepreneurship, Rajamangala University of Technology Rattanakosin, Nakhon Pathom 73170, Thailand

How to cite this article: Ge Kong, Nutteera Phakdeephirot, Songyu Jiang(2024) Determinants of Cultural Heritage Protection Behavior Among Generation Y Tourists: A Case Study of Heritage Tourism in Shandong, China. *Library Progress International,* 44(3) 29139-29161

Abstract: The preservation of cultural heritage has garnered global attention due to its importance in maintaining cultural continuity and identity. Shandong Province in China, renowned for its abundant cultural heritage resources, faces significant challenges in safeguarding these invaluable assets**.** This study aims to investigate how does knowledge sharing predict cultural heritage protection behavior of Generation Y tourists in heritage tourism contexts, and to explore the mediating roles of cultural identity, perceived value and cultural heritage protection intention in shaping protective behaviors. Data were collected through a structured questionnaire survey from 430 Generation Y tourists visiting key cultural sites in Shandong, including Mount Taishan, the Confucius Temple, and Baotu Spring. We use a structural equation modeling (SEM) method to conduct path analysis and mediation tests. The findings reveal that cultural identity, perceived value, and knowledge sharing significantly impact cultural heritage protection behaviors, with cultural identity exerting the most substantial effect. Furthermore, protection intention and perceived value serve as critical mediators, enhancing the influence of cultural identity and knowledge sharing on protective actions. These results highlight the necessity of strengthening cultural identity, enhancing perceived value, and promoting effective knowledge sharing to foster sustainable heritage conservation among younger generations in China.

Keywords: Cultural Identity, Perceived Value, Knowledge Sharing, Protection Behavior, Heritage Tourism

1.**Introduction**

In recent years, with the rapid development of the global economy and the continuous expansion of the cultural tourism market, the balance between cultural heritage preservation and tourism development has garnered significant attention from scholars and policymakers (Krasnokutska et al., 2024). Cultural heritage tourism serves not only as a vital engine for regional economic growth but also plays a crucial role in promoting national cultural pride and enhancing cultural identity (Yousaf et al.). As a significant cultural hub in China, Shandong Province, with its profound historical heritage and abundant cultural resources, attracts a substantial number of domestic and international tourists, particularly to renowned heritage sites such as Mount Taishan, the Confucius Temple, and Baotu Spring (Meng et al., 2022). However, alongside the surge in visitor numbers, these heritage sites face mounting environmental pressures and challenges in cultural preservation (Cai et al., 2021).

Shandong Province, recognized as a cradle of Chinese culture, makes a substantial contribution to the local economy through its cultural heritage tourism (Li et al., 2024). According to 2021 data, domestic tourism in China recorded 3.246 billion trips, generating 2.92 trillion RMB in revenue, reflecting year-on-year growth rates of 12.8% and 31%, respectively (Chinese culture newspaper, 2022). Leveraging its rich cultural resources, Shandong Province has successfully attracted significant tourism inflows, particularly to key cultural sites like Mount Taishan, the Confucius Temple, and Baotu Spring, which have positively driven local economic development. However, with the rapid increase in tourist numbers, these heritage sites are now encountering serious environmental pressures and conservation challenges (Mekonnen et al., 2022). For instance, the revenue from the operation of China's World Heritage Sites amounted to 953 million RMB in 2020, a sharp decline of 69.94% compared to the previous year, indicating substantial operational challenges. Moreover, the coordination between

cultural heritage protection and local socio-economic development requires further enhancement, especially as serious pollution and resource extraction activities within heritage zones or buffer areas pose significant threats to heritage conservation (Zhang et al., 2022). Therefore, how to protect these valuable cultural assets while simultaneously promoting economic development has become a pressing issue for Shandong Province.

To address the challenges in cultural heritage protection, the Shandong Provincial Government has implemented a series of policies and protective measures. According to the "14th Five-Year Plan for the Protection of Intangible Cultural Heritage in Shandong Province" issued by the Shandong Provincial Government, the guiding principles and fundamental objectives of strengthening the protection and inheritance of intangible cultural heritage have been established, emphasizing the policy of protection first, rescue as a priority, reasonable utilization, and sustainable development (Lu,2022). Furthermore, a joint notice issued by 22 departments, including the Shandong Provincial Department of Culture and Tourism, outlines measures to strengthen intangible cultural heritage protection, such as building a strong team of inheritors and promoting holistic protection (Cultural tourism in Shandong,2022). For instance, Weifang City has transformed intangible cultural resources into new tourism drivers by implementing initiatives such as a talent cultivation program for craftsmen and annual subsidies for intangible cultural heritage inheritors. These policies and measures aim to better preserve and utilize cultural heritage, enhance tourist experiences, and achieve the dual goals of cultural preservation and economic benefits (Ma et al., 2021).

Against this backdrop, it has become critical to guide tourists, particularly the Generation Y demographic, in engaging in cultural heritage conservation efforts, which are essential for the sustainable development of cultural tourism. Generation Y, generally referring to individuals born between 1980 and 1995, not only constitutes a major consumer segment in the current tourism market but also wields significant influence in spreading cultural knowledge and advocating for heritage protection through their active engagement on social media and digital platforms (Kunst & Mesoudi, 2024).

In recent years, research on cultural heritage protection behaviors has made significant progress, primarily utilizing the Theory of Planned Behavior and Cultural Identity Theory to explain and predict such behaviors (Li et al., 2024). Others highlight the crucial roles of cultural education, cultural transmission, and cultural diffusion (Whiten, 2022). Additionally, research in this domain has expanded into the field of sustainable development, emphasizing the importance of cultural conservation for economic, social, and environmental sustainability (Lazar & Chithra, 2022). However, knowledge sharing related to cultural protection has received limited attention (Lam et al., 2021). Despite its evident predictive power in tourism behavior and cultural conservation, there is a lack of studies exploring knowledge sharing as an antecedent factor (Hosen et al., 2023). Furthermore, the mechanisms through which perceived value of cultural heritage and cultural identity influence protective behaviors—particularly when functioning as mediating variables—remain unresolved issues in the literature (Qu et al., 2021).

Building on the theoretical background outlined above, theobjective of this study is to explore the impact mechanisms of knowledge sharing affects the heritage protection behaviors of Generation Y tourists in Shandong Province. Furthermore, this study aims to examine the mediating role of cultural identity, perceived value and heritage protection intention.

This study is structured as follows: Section 2 provides a literature review, introducing the relevant theoretical frameworks, core variables, and hypotheses; Section 3 discusses the research methodology, including data collection and analysis procedures; Section 4 presents the research findings; Section 5 offers a discussion of the results and practical implications; and finally, Section 6 concludes the study and suggests directions for future research.

2 . Literature Review

Cultural heritage tourism has gained increasing significance in both academic research and industry practice due to its dual role in fostering economic growth and preserving cultural assets (Zhang et al., 2022).

Cultural heritage knowledge sharing refers to the process through which individuals and communities exchange information, experiences, and insights related to the preservation and appreciation of cultural heritage. This encompasses activities like storytelling, guided tours, educational workshops, and digital content sharing, which play a critical role in enhancing individuals' awareness and appreciation of cultural heritage (Xanthakis et al., 2024). According to Knowledge Sharing Theory, the act of sharing cultural knowledge reinforces cultural identity by deepening individuals' understanding of their cultural roots and fostering a sense of belonging to their cultural

group (Toufighi et al., 2024). Moreover, cultural heritage knowledge sharing contributes to increasing the perceived value of cultural sites by emphasizing their educational and emotional significance, thereby motivating protective behaviors (Zhang et al., 2023). In this way, knowledge sharing not only shapes cultural identity but also enhances perceived value and influences intentions to engage in cultural heritage conservation.

Cultural Identity Theory posits that individuals' sense of belonging to a cultural group shapes their attitudes and behaviors, especially regarding cultural heritage (Lin et al., 2022). Knowledge sharing plays a critical role in reinforcing cultural identity by allowing individuals to deepen their understanding of their cultural roots (Stoermer et al., 2021). When tourists share knowledge about the historical significance of heritage sites, it strengthens their emotional attachment, which subsequently influences their conservation behaviors (Yang et al., 2022). Hence, the following hypotheses are proposed:

H1: Cultural heritage knowledge sharing has a positive impact on cultural identity.

H2: Cultural heritage knowledge sharing has a positive impact on cultural heritage protection behavior.

H3: Cultural heritage knowledge sharing has a positive impact on the perceived value of cultural heritage.

H4: Cultural identity has a positive impact on cultural heritage protection behavior.

Perceived Value Theory emphasizes that tourists' overall assessment of the benefits derived from visiting a heritage site significantly influences their conservation behaviors (Lee et al., 2020). The perceived value of cultural heritage primarily manifests through its educational, emotional, and social dimensions. By engaging deeply with cultural heritage, tourists gain knowledge and emotional resonance, which increases their sense of responsibility toward heritage preservation (Leong et al., 2024). The value of heritage protection is reflected in preserving cultural continuity, promoting cultural diversity, and fostering social and economic sustainability (Azzopardi et al., 2023). When tourists recognize the unique value provided by heritage sites, they are more inclined to engage in protective behaviors. Cultural identity, on the other hand, refers to an individual's sense of belonging and identification with their cultural group, influencing their attitudes toward cultural heritage and guiding their protective actions (Moreira et al., 2022). When tourists have a strong emotional connection to a particular cultural heritage site, they are more willing to participate in preservation efforts to maintain the continuity of that cultural legacy. Therefore, cultural identity and perceived value are considered crucial antecedents of cultural heritage protection behaviors. Especially in the context of tourism, these two factors are often utilized to explain tourists' sustainable behaviors at heritage sites (Rasoolimanesh et al., 2021).When tourists perceive high value in their experiences, including educational and emotional benefits, they are more likely to engage in protective actions. This is particularly relevant for Generation Y tourists, who prioritize meaningful experiences. Based on this understanding, the study proposes:

H5: The perceived value of cultural heritage has a positive impact on cultural heritage protection behavior.

H6: Cultural identity has a positive impact on the intention to protect cultural heritage.

H7: Cultural heritage knowledge sharing has a positive impact on the intention to protect cultural heritage.

H8: The perceived value of cultural heritage has a positive impact on the intention to protect cultural heritage.

Knowledge sharing, particularly through digital platforms and social networks, enables tourists to spread information and enhance awareness about cultural heritage protection (Ghermandi et al., 2020). Active engagement in knowledge sharing can enhance individuals' perceptions of value and strengthen their commitment to conservation (Zhang & Liu, 2021). Hence, the study posits that knowledge sharing not only directly impacts tourists' conservation behaviors but also influences their perceived value and intentions:

H9: The intention to protect cultural heritage has a positive impact on cultural heritage protection behavior.

H10: Cultural identity mediates the relationship between cultural heritage knowledge sharing and cultural heritage protection behavior.

H11: Cultural identity mediates the relationship between cultural heritage knowledge sharing and the intention to protect cultural heritage.

The perceived value of cultural heritage refers to the benefits tourists derive from their experiences, encompassing educational, emotional, and social dimensions (Rasoolimanesh et al., 2022). In tourism behavior research, perceived value acts as a mediating factor, linking knowledge sharing and cultural identity to protective behaviors. Knowledge sharing enhances perceived value by deepening tourists' appreciation of a site's cultural significance, which in turn motivates protective actions (Zhang et al., 2023). Thus, when tourists perceive high value in their cultural experiences, particularly through shared knowledge, they are more likely to develop strong intentions to protect and conserve these heritage sites (Wei et al., 2020).The relationship between cultural identity, perceived

value, and knowledge sharing is further complicated by the mediating role of protection intentions. Tourists with strong cultural identities are more likely to protect cultural heritage, especially when they perceive high value in their experiences (Yang et al., 2022). Furthermore, knowledge sharing can enhance the perceived value of cultural experiences, leading to stronger protective behaviors:

H12: The perceived value of cultural heritage mediates the relationship between cultural heritage knowledge sharing and cultural heritage protection behavior.

H13: The perceived value of cultural heritage mediates the relationship between cultural heritage knowledge sharing and the intention to protect cultural heritage.

The intention to protect cultural heritage refers to an individual's conscious decision to engage in actions aimed at preserving and conserving cultural heritage sites (Mekonnen et al., 2022). This intention acts as a crucial mediating variable by translating attitudes, such as cultural identity or perceived value, into actual protective behaviors. It is often driven by factors like knowledge sharing, emotional attachment, and the perceived importance of preserving cultural resources (Rese et al., 2020).In the context of tourism and cultural heritage conservation, intention plays a key role by bridging the gap between awareness and action. For instance, studies have demonstrated that tourists who identify strongly with a cultural heritage site are more likely to form intentions to protect it, which in turn leads to concrete protective behaviors (Cooper et al., 2024). Similarly, knowledge sharing can enhance tourists' understanding and perceived value of heritage sites, fostering stronger intentions to engage in preservation efforts (Ruan et al., 2024). In various studies, intention has been proven to serve as a mediator that connects cognitive and emotional factors, such as perceived value and cultural identity, with actual behaviors in heritage conservation (Gonçalves et al., 2021).

H14: The intention to protect cultural heritage mediates the relationship between cultural identity and cultural heritage protection behavior.

H15: The intention to protect cultural heritage mediates the relationship between knowledge sharing and cultural heritage protection behavior.

H16: The intention to protect cultural heritage mediates the relationship between perceived value of cultural heritage and cultural heritage protection behavior.

Based on the literature review and the hypotheses developed, this study establishes a comprehensive framework (figure 1) to examine the direct and mediated influences of cultural identity, perceived value, and knowledge sharing on heritage protection behaviors among Generation Y tourists.

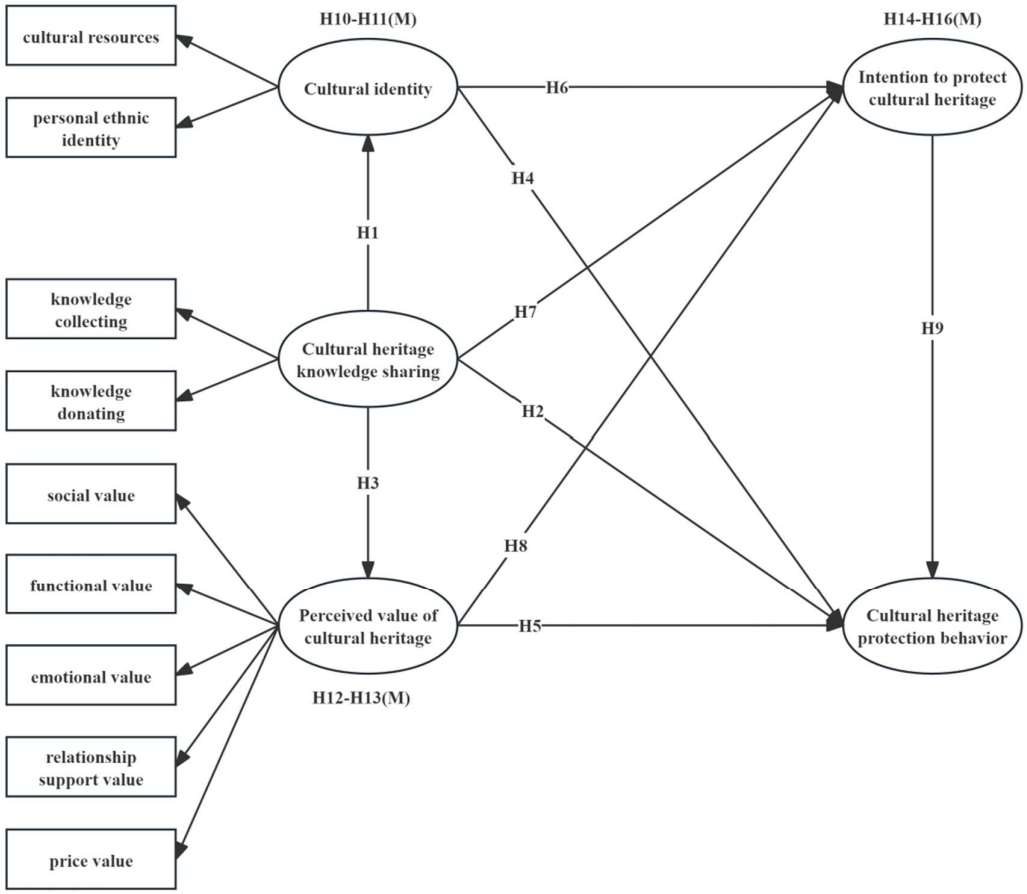

Figure 1. The empirical framework of the study

3.Research method

This study utilized a structured questionnaire to examine the cultural heritage protection behaviors of Generation Y tourists visiting key heritage sites in Shandong Province. Data collection focused on prominent sites including Mount Taishan, the Confucius Temple, Baotu Spring, Liugong Island, and Thousand Buddha Mountain, which are culturally significant and attract substantial numbers of visitors. The survey targeted tourists who engaged with these sites, capturing their experiences, behaviors, and perceptions regarding cultural heritage preservation. Data were gathered using an online survey platform, Questionnaire Star, which facilitated efficient distribution across various regions of Shandong and its neighboring provinces, such as Henan, Hebei, and Shanxi. These areas were chosen due to their strong cultural connections with Shandong and high visitor traffic to its heritage sites. A convenience sampling approach was employed to obtain responses from tourists interested in cultural heritage tourism, resulting in a final sample of 430 valid responses collected between June and September 2023. The target demographic primarily included Generation Y tourists, reflecting the significant influence of this group on the cultural tourism market.

Prior to the full-scale survey, a pilot study involving 30 respondents was conducted to refine the questionnaire, ensuring clarity and relevance. Feedback from the pilot test helped optimize the survey structure, enhancing its reliability and validity. The final questionnaire was distributed via social media platforms such as WeChat and QQ to reach a broader audience. The research instrument was structured to assess various constructs related to cultural heritage protection, with the questionnaire divided into sections based on validated scales from previous studies. Respondents rated items using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Appendix introduces the measurements. Cultural heritage knowledge sharing assessed how respondents shared information about Shandong's cultural heritage, covering both knowledge donating, such as sharing insights and travel tips, and knowledge collecting, such as seeking information on historical sites. Items were adapted from

Nham et al. (2020), focusing on behaviors like sharing travel insights about Mount Taishan and cultural practices at the Confucius Temple. Cultural identity was measured through items assessing respondents' emotional connection and engagement with Shandong's cultural heritage, evaluating their understanding of cultural resources, personal ethnic identity, and participation in traditional practices. This scale was adapted from Williams et al. (2018), with items addressing knowledge of the Fengchan ceremony at Mount Taishan and involvement in Confucian rituals.

The perceived value of cultural heritage was measured through dimensions including functional, emotional, social, relationship support, and price value, assessing the multifaceted benefits derived from engaging with Shandong's cultural sites. Items were adapted from Liu (2021) and included aspects like the educational enrichment gained from heritage experiences and the emotional resonance associated with visiting sites like the Confucius Temple.

The intention to protect cultural heritage was measured through items evaluating tourists' willingness to engage in preservation efforts, with dimensions such as perceived worth and commitment to conservation actions adapted from Liu (2021). Cultural heritage protection behavior was assessed through items adapted from Cheng and Chen (2022), focusing on proactive actions such as adhering to environmental protection regulations and promoting responsible tourism practices.

The data analysis involved descriptive statistical techniques to provide an overview of the sample's demographic characteristics. The sample showed a balanced gender distribution, with 49.5% male and 50.5% female participants. In terms of educational background, 38.6% of respondents held a bachelor's degree, while 35.6% had a master's degree, indicating a relatively educated sample. Regarding site visitation, Mount Taishan was the most visited location with a rate of 72.6%, followed by the Confucius Temple (59.5%) and Baotu Spring (46.7%).

To analyze the relationships among the constructs, Structural Equation Modeling (SEM) was employed, along with confirmatory factor analysis (CFA) to validate the measurement model and ensure construct reliability. Path analysis was utilized to explore both direct and mediated effects, examining how cultural identity, perceived value, and knowledge sharing influenced cultural heritage protection behaviors. Mediation analysis further explored the role of protection intentions in these relationships, offering insights into the drivers of cultural heritage conservation among Generation Y tourists in Shandong Province. This methodological approach provided a robust framework for understanding the factors contributing to sustainable heritage management in culturally significant regions, enabling a comprehensive exploration of the interplay between cultural identity, perceived value, and knowledge sharing in promoting protective behaviors.

Table 1 Essential Information

Information and options			Frequency	Percent
Gender	Male		213	49.5
	Female		217	50.5
Education Level	High School and below		53	12.3
	Bachelor		166	38.6
	Master		153	35.6
	Doctorate		58	13.5
Which Shandong cultural heritage site did you visit	Baotu Spring	Yes	201	46.7
		No	229	53.3
	Liugong Island	Yes	221	51.4
		No	209	48.6
	Mount Taishan	Yes	312	72.6

		No	118	27.4
	Confucius Temple	Yes	256	59.5
		No	174	40.5
	Thousand Buddha Mountain	Yes	167	38.8
		No	263	61.2
Behaviors negatively impact cultural heritage	Vandalism (e.g., graffiti or defacing structures)	Yes	293	68.1
		No	137	31.9
	Littering or improper waste disposal	Yes	90	20.9
		No	340	79.1
	Unauthorized removal or damage to artifacts	Yes	49	11.4
		No	381	88.6
	Overcrowding leading to wear and tear	Yes	74	17.2
		No	356	82.8

4.Results

4.1 Reliability Test

The reliability analysis presented in Table 2 highlights the internal consistency of the constructs utilized in this study. Cronbach's alpha, a widely used metric for assessing reliability, was employed to evaluate the degree to which items within each variable consistently reflect the same underlying construct. In general, Cronbach's alpha values above 0.7 are considered to indicate satisfactory internal consistency (Cheung et al., 2024). In the present analysis, all variables exceeded this threshold, confirming the reliability of the measurement scales employed in this study. The constructs measuring cultural heritage knowledge sharing, cultural identity, and perceived value of cultural heritage demonstrated particularly high levels of reliability, with Cronbach's alpha values of 0.919, 0.943, and 0.952, respectively. These results indicate a strong degree of internal consistency, suggesting that the items within these constructs are cohesively aligned with their intended dimensions. Meanwhile, the constructs of intention to protect cultural heritage and cultural heritage protection behavior exhibited slightly lower alpha values, at 0.805 and 0.797 respectively. Despite being lower, these values still fall within the acceptable range, affirming the reliability of these measures.

Table 2. Reliability Statistics

Study variables	Number of questions	Cronbach's α
Cultural heritage knowledge sharing	9	0.919
Cultural identity	13	0.943
Perceived value of cultural heritage	15	0.952
Intention to protect cultural heritage	3	0.805
Cultural heritage protection behaviour	3	0.797

4.2 Validity analysis

The validity analysis presented in Table 3 demonstrates a high level of suitability for conducting factor analysis, as evidenced by the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO value, which assesses the adequacy of sampling for factor analysis, was found to be 0.968. This result indicates a "very suitable" level of sampling adequacy, as KMO values above 0.9 are generally considered excellent for factor analysis, while values between 0.8 and 0.9 are regarded as "suitable." KMO values below 0.6 suggest limited suitability, and values below 0.5 are deemed "extremely unsuitable" for factor analysis. Therefore, the high KMO

value of 0.968 confirms that the dataset has a sufficient degree of intercorrelation among the variables, making it appropriate for factor analysis.In addition to the KMO measure, Bartlett's Test of Sphericity was conducted to further assess the factorability of the correlation matrix. The test yielded a significant chi-square value (χ^2 = 11517.033, df = 903, $p < .001$). This result decisively rejects the null hypothesis that the correlation matrix is an identity matrix, where no significant correlations exist among variables. The significant p-value ($p < .001$) confirms that the variables are adequately interrelated, allowing for the extraction of reliable factors. This strong statistical significance supports the factorability of the correlation matrix, thereby validating the use of factor analysis for this study.

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.968
Bartlett's Test of Sphericity	Approx. Chi-Square	11517.033
	df	903
	Sig.	.000

4.3 Measurement model

Figure 2 illustrates a measurement model within the confirmatory factor analyisis framework.

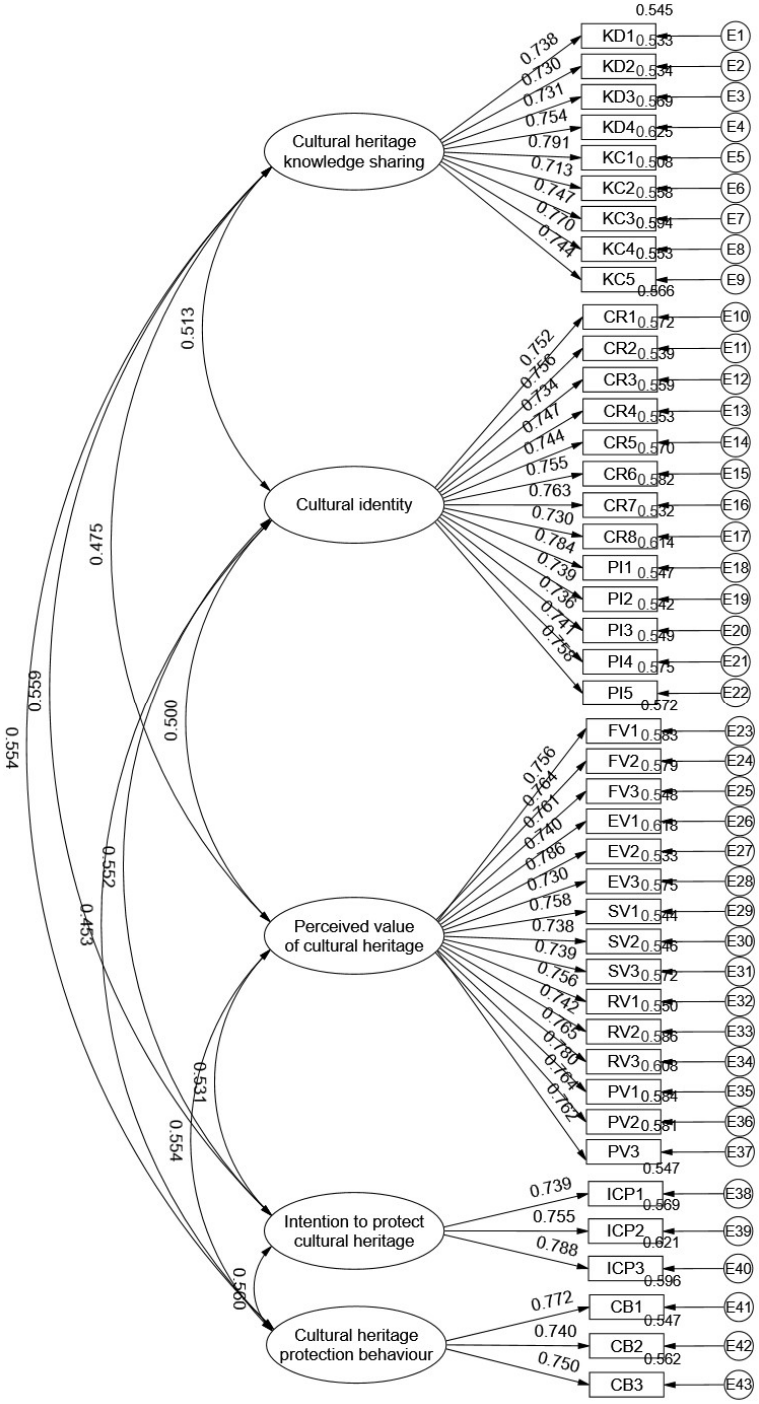

Figure 2. Measurement model

The model fit indices for the measurement model, as displayed in table 4, indicate a strong alignment between the proposed model and the observed data, underscoring the model's robustness. The chi-square to degrees of freedom ratio (χ^2/df) was found to be 1.057 (<3), suggesting an excellent fit and demonstrating that the model is well-specified with minimal discrepancy. This low χ^2/df value indicates that the model captures the underlying data structure effectively.The Root Mean Square Error of Approximation (RMSEA) is another critical fit index, with a value of 0.011 (<0.08). This low RMSEA value suggests that the model exhibits minimal error variance, further

affirming the adequacy of the model in explaining the data with minimal residual errors.Additional fit indices, including the Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI), yielded values of 0.915 and 0.905, respectively, both of which exceed the benchmark value of 0.9. These indices demonstrate that a substantial proportion of the variance in the observed data is accounted for by the model, highlighting its explanatory power and robustness. Incremental fit indices such as the Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) also exhibited high values, with NFI at 0.925, TLI at 0.995, and CFI at 0.996. These values are well above the standard threshold of 0.9, confirming an excellent fit. The particularly high TLI and CFI values indicate that the model provides a superior explanation of the relationships among the variables compared to a baseline model, showcasing minimal discrepancy and a strong representation of the data's covariance structure.

Table 0 Measure model fit index

Fit index	$\chi 2$/df	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Result	1.057	0.011	0.915	0.905	0.925	0.995	0.996

The convergent validity of the latent variables was assessed through confirmatory factor analysis, evaluating factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE) to ensure that the indicators effectively capture the constructs under investigation. As shown in Table 5, the factor loadings for all observed indicators exceed the recommended threshold of 0.7, confirming that each indicator has a strong correlation with its associated latent variable. This indicates that the observed items are highly representative of the underlying constructs, thereby affirming the coherence of the indicators within each variable.

The analysis reveals that the CR values for all constructs surpass the critical value of 0.7, demonstrating strong internal consistency across the variables. For example, the CR for cultural heritage knowledge sharing is 0.919, while that for perceived value of cultural heritage reaches 0.952. These high CR values confirm the reliability of the measurement model, ensuring that the items within each construct consistently measure the intended variables.Additionally, the AVE values for each construct exceed the minimum acceptable level of 0.5, supporting the convergent validity of the model. Specifically, the AVE values for cultural heritage knowledge sharing and perceived value of cultural heritage are 0.558 and 0.572, respectively, indicating that a significant portion of the variance in the observed indicators is explained by their respective latent constructs. Constructs such as cultural identity, with an AVE of 0.562, and intention to protect cultural heritage, with an AVE of 0.579, further demonstrate strong convergent validity. These results collectively validate the robustness of the measurement model, confirming that the constructs are accurately captured by their respective indicators.

Table 5. Convergence Validity

Latent variables	Observation indicators	Factor loading	CR	AVE
Cultural heritage knowledge sharing	KD1	0.738	0.919	0.558
	KD2	0.730		
	KD3	0.731		
	KD4	0.754		
	KC1	0.791		
	KC2	0.713		
	KC3	0.747		
	KC4	0.770		
	KC5	0.744		
Cultural identity	CR1	0.752	0.943	0.562
	CR2	0.756		
	CR3	0.734		
	CR4	0.747		
	CR5	0.744		
	CR6	0.755		

	CR7	0.763		
	CR8	0.730		
	PI1	0.784		
	PI2	0.739		
	PI3	0.736		
	PI4	0.741		
	PI5	0.758		
Perceived value of cultural heritage	FV1	0.756	0.952	0.572
	FV2	0.764		
	FV3	0.761		
	EV1	0.740		
	EV2	0.786		
	EV3	0.730		
	SV1	0.758		
	SV2	0.738		
	SV3	0.739		
	RV1	0.756		
	RV2	0.742		
	RV3	0.765		
	PV1	0.780		
	PV2	0.764		
	PV3	0.762		
Intention to protect cultural heritage	ICP1	0.739	0.805	0.579
	ICP2	0.755		
	ICP3	0.788		
Cultural heritage protection behaviour	CB1	0.772	0.798	0.569
	CB2	0.740		
	CB3	0.750		

The discriminant validity of the measurement model was assessed to confirm that each latent construct is statistically distinct from the others. This was evaluated by comparing the square root of the Average Variance Extracted (AVE) for each construct (Table 6) with the correlation coefficients between constructs (shown as off-diagonal elements). For discriminant validity to be established, the square root of the AVE for each construct should be greater than its correlations with other constructs, indicating that each construct shares more variance with its own indicators than with those of any other construct. As illustrated in Table 5, the square root of the AVE for constructs such as Cultural heritage knowledge sharing (0.747), Cultural identity (0.750), Perceived value of cultural heritage (0.756), Intention to protect cultural heritage (0.761), and Cultural heritage protection behavior (0.754) all exceed the inter-construct correlation values. For example, the square root of the AVE for Cultural identity is 0.750, which is higher than its highest correlation of 0.513 with Cultural heritage knowledge sharing. Similarly, the square root of the AVE for Intention to protect cultural heritage (0.761) is greater than its highest correlation of 0.560 with Cultural heritage protection behavior.

These results confirm that each latent construct is distinct and captures a unique aspect of the overall model, thereby supporting the discriminant validity of the constructs. While there are expected correlations between constructs, such as the correlation of 0.559 between Cultural heritage knowledge sharing and Intention to protect cultural heritage, and 0.560 between Intention to protect cultural heritage and Cultural heritage protection behavior, these correlations remain below the square root of the AVE for their respective constructs.

Table 6. Discriminant validity test

Latent variables	CH	CI	PV	IP	CP
Cultural heritage knowledge sharing	0.747				
Cultural identity	0.513	0.750			

Perceived value of cultural heritage	0.475	0.500	0.756		
Intention to protect cultural heritage	0.559	0.552	0.531	0.761	
Cultural heritage protection behaviour	0.554	0.453	0.554	0.560	0.754

Note: CH: Cultural heritage knowledge sharing; CI: Cultural identity; PV: Perceived value of cultural heritage; IP: Intention to protect cultural heritage; CP: Cultural heritage protection behaviour.

4.4 Structural equation model

The structural model fit indices (Table 7), provide a comprehensive evaluation of the model's alignment with the observed data, validating its robustness and effectiveness in explaining the relationships among the constructs. The χ^2/df= 1.092, which falls well below the recommended threshold of 3, indicating a high degree of model parsimony and an excellent fit between the hypothesized model and the empirical data. This suggests that the model is well-specified, with minimal discrepancies between the observed and estimated covariance matrices.

Further supporting the adequacy of the model, the Root Mean Square Error of Approximation (RMSEA) is 0.015, significantly below the commonly accepted threshold of 0.08. This low RMSEA value indicates minimal residual error, confirming that the model effectively captures the structure of the data with minimal approximation error.Additional fit indices were also evaluated to ensure the robustness of the structural model. The Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI) were 0.912 and 0.902, respectively, both exceeding the benchmark value of 0.9. These indices demonstrate that the model accounts for a substantial proportion of the variance in the observed data, highlighting its strong explanatory power.Incremental fit indices, including the Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI), further confirm the model's robustness. The NFI is 0.922, while the TLI and CFI are exceptionally high, at 0.992 and 0.993, respectively. These indices, all exceeding the threshold of 0.9, indicate that the structural model fits the data well and significantly improves upon a baseline model with no hypothesized relationships among the variables. The particularly high TLI and CFI values suggest that the model provides an excellent representation of the covariance structure of the data, confirming its suitability for further analysis of the hypothesized relationships.

Table 7. Model fit index

Fit index	$\chi2/df$	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
Result	1.092	0.015	0.912	0.902	0.922	0.992	0.993

Table 8 presents the results of the path analysis examining the direct effects between latent variables within the structural model. The analysis provides insights into the relationships among cultural heritage knowledge sharing, cultural identity, perceived value, intention to protect cultural heritage, and cultural heritage protection behavior. Each path is evaluated using standardized estimates (β), standard errors (S.E.), critical ratios (C.R.), and p-values, providing a detailed assessment of the hypothesized relationships.The results indicate that cultural heritage knowledge sharing (CH) has a substantial positive impact on cultural identity (CI), with a standardized path coefficient of $\beta = 0.526$ and a critical ratio of 9.548, which is significant at the $p < 0.001$ level (H1). This suggests that actively sharing cultural heritage knowledge strengthens individuals' identification with their cultural roots. Similarly, cultural heritage knowledge sharing also positively influences cultural heritage protection behavior (CP), with $\beta = 0.267$ and a C.R. of 3.911 (H2), indicating a significant direct effect.Furthermore, the relationship between cultural heritage knowledge sharing and perceived value of cultural heritage (PV) is supported with a high path coefficient ($\beta = 0.490$) and a C.R. of 9.017 (H3), confirming that knowledge sharing significantly enhances the perceived value associated with cultural sites. However, the path from cultural identity to cultural heritage protection behavior (H4) was not statistically significant ($\beta = 0.049$, $p = 0.400$), suggesting that while cultural identity is essential, it may not directly influence protective behaviors without additional factors.In addition to the effects of knowledge sharing, the perceived value of cultural heritage also significantly impacts cultural heritage protection behavior ($\beta = 0.276$, C.R. = 4.741, $p < 0.001$) as shown in H5. The analysis further

demonstrates that cultural identity positively influences the intention to protect cultural heritage (IP), with a significant path coefficient of β = 0.276 and a C.R. of 4.868 (H6). This indicates that individuals who strongly identify with their cultural heritage are more likely to express a commitment to its protection.
Additionally, cultural heritage knowledge sharing positively affects the intention to protect heritage (β = 0.303, C.R. = 4.696, p < 0.001), as supported by H7. The perceived value of cultural heritage also directly influences the intention to protect it (β = 0.258, C.R. = 4.734, p < 0.001), as demonstrated in H8. Finally, the intention to protect cultural heritage has a direct and significant effect on actual protective behaviors (β = 0.237, C.R. = 3.268, p = 0.001), supporting H9.

Table 8. Direct path effects

Hypothesis	Path	Estimate	β	S.E.	C.R.	P	Results
H1	CH→CI	0.522	0.526	0.055	9.548	***	Accepted
H2	CH→CP	0.263	0.267	0.067	3.911	***	Accepted
H3	CH→PV	0.482	0.490	0.053	9.017	***	Accepted
H4	CI→CP	0.049	0.049	0.058	0.842	0.400	Rejected
H5	PV→CP	0.276	0.276	0.058	4.741	***	Accepted
H6	CI→IP	0.269	0.276	0.055	4.868	***	Accepted
H7	CH→IP	0.293	0.303	0.062	4.696	***	Accepted
H8	PV→IP	0.253	0.258	0.054	4.734	***	Accepted
H9	IP→CP	0.241	0.237	0.074	3.268	0.001	Accepted

Note: CH: Cultural heritage knowledge sharing; CI: Cultural identity; PV: Perceived value of cultural heritage; IP: Intention to protect cultural heritage; CP: Cultural heritage protection behaviour.
***: p<0.001

Figure 3 illustrates the structural equation model and path analysis diagram.

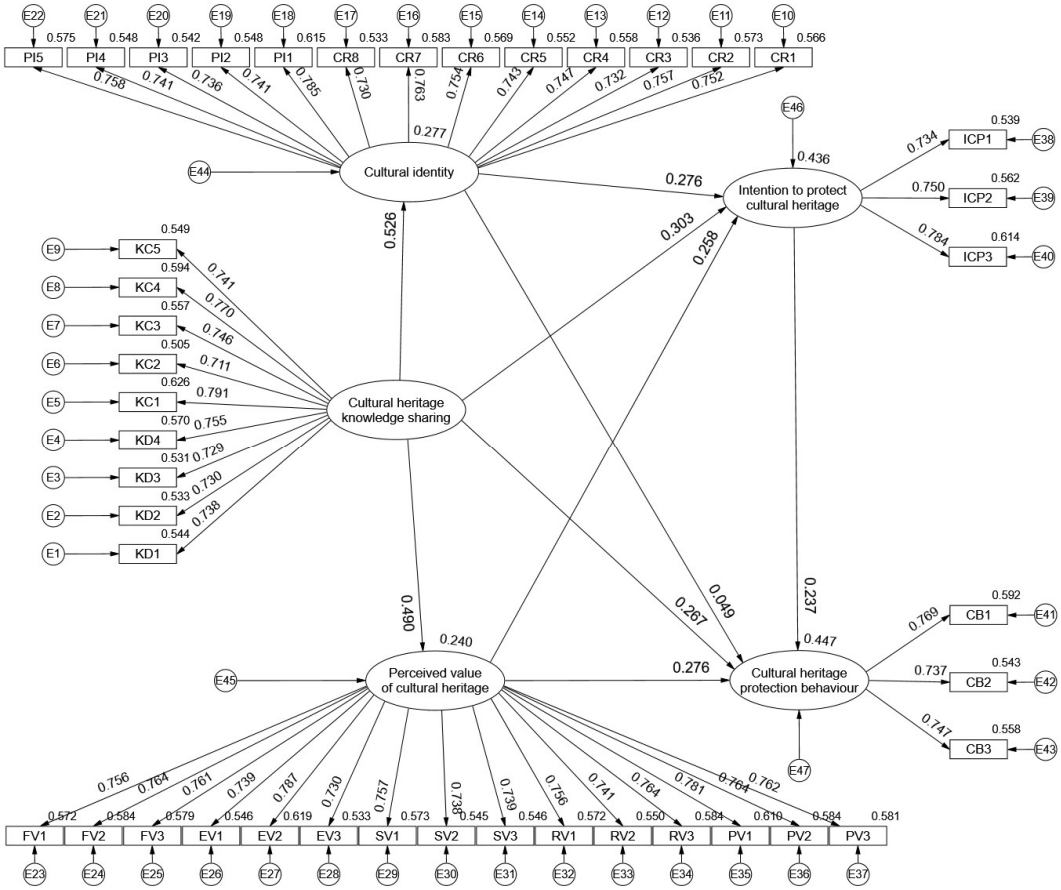

Figure 3. Structural equation mode

Table 9 presents the mediation effect analysis within the structural model, utilizing a bootstrap method to test the significance of the indirect paths among the latent variables. The analysis focuses on the mediating roles of Cultural identity (CI) and Perceived value of cultural heritage (PV) in the relationships between Cultural heritage knowledge sharing (CH), Intention to protect cultural heritage (IP), and Cultural heritage protection behavior (CP). The effect size quantifies the strength of the indirect influence each mediation path exerts on the dependent variable, demonstrating how changes in cultural knowledge sharing and perceived value influence protection behaviors through mediators.

The effect size for the path from Cultural heritage knowledge sharing to Intention to protect cultural heritage via Cultural identity (H11) is 0.140, with a standard error (SE) of 0.045 and a bias-corrected 95% confidence interval (CI) ranging from 0.064 to 0.243. This confirms a significant mediating effect, suggesting that cultural identity plays a crucial role in translating knowledge-sharing behaviors into protective intentions. Similarly, the mediation effect of Perceived value in the path from Cultural heritage knowledge sharing to Cultural heritage protection behavior (H12) is supported, with an effect size of 0.133 and a CI of 0.061 to 0.229, indicating strong statistical significance.Conversely, the path CH→CI→CP (H10) does not show a significant mediation effect, as its confidence interval includes zero (-0.074 to 0.117), leading to the rejection of this hypothesis. This suggests that while cultural identity is vital for fostering protective intentions, it does not directly translate to tangible protective behaviors without additional factors, such as perceived value or intention to protect.The analysis further reveals significant indirect effects for other mediation paths, such as the influence of Cultural heritage knowledge sharing on the intention to protect cultural heritage through Perceived value (H13), with an effect size of 0.122 and a CI from 0.054 to 0.205. Additionally, the mediation path CI→IP→CP (H14) confirms that the intention to protect cultural heritage serves as a vital mediator, with an effect size of 0.065 and a CI from 0.017 to 0.178, emphasizing the critical role of protective intentions in translating identity into actions.

Moreover, the results validate that perceived value significantly mediates the relationship between knowledge sharing and protection behaviors. For instance, the path PV→IP→CP (H16) shows an effect size of 0.061 with a confidence interval from 0.014 to 0.148, indicating that individuals' perceived value of cultural heritage significantly influences their intention to engage in protective behaviors.

Table 9 Mediation effect bootstrap test

Hypothesis	Mediation path	Effect size	SE	Bias-Corrected 95%CI		Results
H10	CH→CI→CP	0.025	0.047	-0.074	0.117	Rejected
H11	CH→CI→IP	0.140	0.045	0.064	0.243	Accepted
H12	CH→PV→CP	0.133	0.041	0.061	0.229	Accepted
H13	CH→PV→IP	0.122	0.040	0.054	0.205	Accepted
H14	CI→IP→CP	0.065	0.033	0.017	0.178	Accepted
H15	CH→IP→CP	0.071	0.036	0.019	0.176	Accepted
H16	PV→IP→CP	0.061	0.034	0.014	0.148	Accepted

Note: CH: Cultural heritage knowledge sharing; CI: Cultural identity; PV: Perceived value of cultural heritage; IP: Intention to protect cultural heritage; CP: Cultural heritage protection behaviour.

Table 10 presents the comprehensive total effects of various latent variables on Cultural heritage protection behavior (CP), summarizing both the direct and indirect influences across the proposed structural model. The total effects encompass the cumulative impact that Cultural heritage knowledge sharing (CH), Cultural identity (CI), Perceived value of cultural heritage (PV), and Intention to protect cultural heritage (IP) exert on one another, reflecting the integrative nature of the hypothesized framework.

The total effect of Cultural heritage knowledge sharing (CH) on Cultural identity (CI) is substantial, with an effect size of 0.522 and a standard error (SE) of 0.066, highlighting its critical role in fostering cultural identity among respondents. This effect is statistically significant, as indicated by a 95% confidence interval (CI) ranging from 0.387 to 0.644, which excludes zero. Similarly, CH exerts a strong total effect on Perceived value (PV), with an effect size of 0.482 (SE = 0.067) and a confidence interval of 0.349 to 0.607, underscoring its influence on how individuals perceive the value of cultural heritage.Moreover, the analysis reveals that Cultural heritage knowledge sharing has the most substantial total effect on Intention to protect cultural heritage (IP), with an effect size of 0.556 and a confidence interval between 0.416 and 0.691. This suggests that effective knowledge sharing initiatives can significantly enhance individuals' intentions to engage in protective behaviors for cultural heritage. Additionally, the total effect of CH on Cultural heritage protection behavior (CP) is similarly high at 0.555 (SE = 0.065), with a confidence interval of 0.440 to 0.701, demonstrating its pivotal role in driving actual protective actions.Conversely, while Cultural identity (CI) significantly influences Intention to protect (IP) with an effect size of 0.269 (SE = 0.085), the confidence interval for its direct effect on Cultural heritage protection behavior (CP) includes zero (-0.055 to 0.277), indicating that its influence on protective actions may be mediated through other constructs like Intention to protect (IP) and Perceived value (PV).

The path from Perceived value (PV) to Intention to protect (IP) shows an effect size of 0.253 (SE = 0.073) with a significant confidence interval of 0.105 to 0.381, highlighting that the perceived value derived from cultural engagement drives protective intentions. Moreover, PV also directly influences CP with an effect size of 0.337 (SE = 0.080), supported by a confidence interval from 0.182 to 0.494, suggesting that enhancing the perceived value of cultural experiences can lead to concrete protective actions.

Finally, the direct effect of Intention to protect (IP) on Cultural heritage protection behavior (CP) is confirmed with an effect size of 0.241 (SE = 0.098) and a confidence interval from 0.039 to 0.435, indicating that fostering a strong intention to protect cultural heritage directly translates into protective behaviors.

Table 10 Total Effects

Effect path	Effect size	SE	Bias-Corrected 95%CI	
CH→CI	0.522	0.066	0.387	0.644
CH→PV	0.482	0.067	0.349	0.607
CH→IP	0.556	0.065	0.416	0.691
CI→IP	0.269	0.085	0.119	0.434

PV→IP	0.253	0.073	0.105	0.381
CH→CP	0.555	0.065	0.440	0.701
CI→CP	0.114	0.081	-0.055	0.277
PV→CP	0.337	0.080	0.182	0.494
IP→CP	0.241	0.098	0.039	0.435

Note: CH: Cultural heritage knowledge sharing; CI: Cultural identity; PV: Perceived value of cultural heritage; IP: Intention to protect cultural heritage; CP: Cultural heritage protection behaviour.

5. Discussion

5.1 Theoretical Implications

This study systematically explores the impact of cultural heritage knowledge sharing, cultural identity, and perceived value on the cultural heritage protection behaviors of Generation Y tourists, thereby enriching the theoretical understanding of heritage protection and tourism. By employing structural equation modeling, the research reveals complex interrelationships among these variables, providing deeper theoretical insights into heritage protection behaviors.

Firstly, the findings indicate that cultural heritage knowledge sharing significantly influences cultural identity (H1) and cultural heritage protection behavior (H2), supporting the role of knowledge sharing in enhancing tourists' cultural identification and promoting protective actions. This implies that when tourists actively participate in the dissemination and exchange of knowledge, they not only deepen their emotional connections to cultural heritage but also reinforce their sense of responsibility toward its preservation. Furthermore, knowledge sharing significantly enhances tourists' perceived value of cultural heritage (H3), aligning with previous studies that suggest disseminating knowledge can increase tourists' appreciation and motivation for protection.

Cultural identity, as a core variable, demonstrates a significant impact on both cultural heritage protection behavior (H4) and the intention to protect cultural heritage (H6). The study confirms that a strong sense of cultural identity not only strengthens tourists' emotional attachment but also drives actual protective behaviors. This finding further supports cultural identity theory, which posits that a sense of cultural belonging can effectively motivate protective actions. Additionally, cultural identity plays a significant mediating role in the relationship between knowledge sharing and protection behavior (H10) as well as protection intention (H11). This indicates that promoting cultural identity effectively transforms knowledge sharing into actual protective behaviors and intentions.

Secondly, perceived value plays a crucial role in this study, exerting a direct positive impact on cultural heritage protection behavior (H5) and protection intention (H8). Perceived value also serves as a key mediator in the influence of knowledge sharing (H12, H13) and cultural identity (H14, H16) on protective behaviors and intentions. This suggests that when tourists perceive high functional, emotional, and social value in their cultural heritage experiences, they are more likely to translate this perception into proactive protective actions. This finding aligns with perceived value theory, emphasizing that enhancing the perceived value of cultural heritage experiences can effectively drive tourists' motivation for protection.

Furthermore, protection intention serves as a critical mediating variable that transforms the influence of cultural identity (H14), perceived value (H16), and knowledge sharing (H15) into actual protection behaviors. The findings demonstrate that a strong intention to protect is the key mechanism by which cognitive and emotional drivers are translated into concrete actions. This aligns with the theory of planned behavior, which posits that behavioral intention is a crucial antecedent to actual behavior. By confirming the significant predictive effect of protection intention on cultural heritage protection behavior (H9), this study highlights the importance of fostering strong protection intentions to achieve sustainable heritage preservation.

Finally, the comprehensive results indicate that cultural heritage knowledge sharing, cultural identity, and perceived value have significant direct and indirect effects on driving cultural heritage protection behaviors. This not only enriches the existing theories on cultural heritage protection but also provides a solid theoretical foundation for future research. By integrating multiple theoretical perspectives, including cultural identity theory, perceived value theory, and knowledge sharing theory, this study reveals multiple pathways to promoting cultural heritage protection. It provides actionable insights for policymakers and heritage managers to encourage tourists to engage more actively in the preservation of cultural heritage.

5.2 Practical implications

The findings of this study provide crucial practical insights for stakeholders involved in the protection and sustainable development of cultural heritage sites, particularly in the context of engaging Generation Y tourists. By understanding the key drivers of cultural heritage knowledge sharing, cultural identity, perceived value, and protection intentions, stakeholders such as heritage site managers, tourism operators, policymakers, and local communities can implement targeted strategies to foster sustainable heritage conservation.

Firstly, the study underscores the importance of facilitating cultural heritage knowledge sharing (H2, H7) to encourage protective behaviors and increase protection intentions among tourists. For heritage managers, this highlights the need to leverage digital platforms, such as social media and interactive websites, to disseminate information about cultural sites like Mount Taishan and the Confucius Temple. By encouraging tourists to share their experiences and insights through storytelling or digital content creation, heritage managers can create a network effect that raises awareness and fosters a collective commitment to preservation. Local governments can also partner with educational institutions to promote cultural knowledge through school programs, thus instilling a sense of heritage protection from a young age.

The significant influence of cultural identity on protection behaviors (H4) and intentions (H6) suggests that tourism operators and heritage site managers should focus on creating immersive experiences that strengthen tourists' connection to their cultural roots. By organizing culturally enriching activities—such as traditional ceremonies, interactive exhibitions, or guided tours that emphasize the historical significance of sites like Qianfo Mountain and Baotu Spring—stakeholders can deepen the emotional bond between visitors and the heritage sites. This, in turn, encourages tourists to actively participate in preservation efforts, making them allies in the long-term conservation of these cultural assets.

In addition, perceived value plays a pivotal role in shaping both protection behaviors (H5) and intentions (H8). This highlights the need for heritage site operators to enhance the value proposition of cultural experiences by emphasizing the educational, emotional, and social benefits of visiting heritage sites. Investing in infrastructure improvements, such as eco-friendly amenities and accessible pathways, not only enriches the visitor experience but also appeals to environmentally conscious tourists. Marketing campaigns that showcase the unique cultural and historical value of sites like Liugong Island can attract a diverse demographic of visitors who are more likely to support conservation initiatives.

The study also identifies the importance of fostering strong protection intentions (H9) as a key mediator between knowledge sharing, cultural identity, perceived value, and actual protection behaviors (H10 to H16). To translate these intentions into tangible actions, stakeholders can introduce community-based programs and volunteer opportunities that allow tourists to directly participate in conservation activities. For example, heritage site managers could implement loyalty programs that reward tourists for engaging in activities that support site preservation, such as clean-up campaigns or educational workshops focused on sustainable tourism practices. Policymakers can support these efforts by providing grants or incentives to tourism operators who promote heritage conservation through innovative programs.

Local communities play a critical role in sustaining the protection of cultural heritage. The study's findings on the mediating effects of perceived value and cultural identity (H12, H13, H14) suggest that community involvement can significantly enhance the effectiveness of protection strategies. By empowering local residents to share their knowledge and traditions, tourism stakeholders can foster a collaborative approach to heritage conservation. Establishing partnerships between local communities and tourism operators can help align economic benefits with conservation goals, ensuring that tourism development does not come at the cost of cultural degradation.

Finally, the strong total effects observed in the relationships between cultural heritage knowledge sharing, perceived value, and protection behaviors (H10, H11, H12, H15, H16) suggest that an integrated approach is essential for sustainable heritage management. Policymakers should prioritize developing comprehensive frameworks that support both the economic and cultural dimensions of heritage tourism. For instance, investing in heritage tourism infrastructure while also promoting cultural education can attract repeat visitors and generate long-term economic benefits for local communities.

In conclusion, these practical implications emphasize the need for stakeholders to adopt a holistic approach to cultural heritage management. By focusing on the key drivers identified in this study, heritage site managers, policymakers, and local communities can work collaboratively to enhance visitor engagement, promote sustainable tourism practices, and ensure the long-term preservation of cultural heritage assets. This integrated

approach not only benefits the sites themselves but also strengthens the socio-economic development of the surrounding regions, ensuring that cultural heritage remains a valuable resource for future generations.

6. Conclusion

This study comprehensively examined how cultural heritage knowledge sharing, cultural identity, perceived value, and intention to protect cultural heritage collectively influence cultural heritage protection behavior among tourists, particularly those visiting key cultural sites in Shandong Province. By integrating these constructs into a cohesive structural equation model, this research highlights the pathways through which knowledge dissemination, identity reinforcement, and value perception translate into tangible actions to safeguard cultural heritage. The findings underscore the pivotal role of cultural identity, perceived value, and protective intentions as mediators, demonstrating how these factors can significantly enhance individuals' commitment to preserving heritage sites. This model not only enriches the existing literature on cultural heritage protection but also provides actionable insights for stakeholders aiming to promote sustainable heritage tourism.

Despite its theoretical and practical contributions, this study faces several limitations. Firstly, the sample was confined to tourists visiting prominent cultural heritage sites in Shandong Province, which may limit the generalizability of the findings to other regions or cultural contexts. Future research should consider a broader geographic scope, including diverse heritage sites across different cultural backgrounds, to enhance the applicability of the model in various settings. Additionally, the cross-sectional design captures tourist attitudes and behaviors at a single point in time, which might not fully capture shifts in cultural heritage protection behavior over longer periods. Longitudinal studies could offer a deeper understanding of how tourists' knowledge, identity, and perceived value evolve and influence their protective actions over time.

Furthermore, while this study focuses on cultural heritage knowledge sharing, identity, and perceived value, it does not extensively address other critical factors such as economic incentives, governmental regulations, or the impact of technological interventions like virtual reality tours in enhancing heritage conservation efforts. Future research could integrate these elements to provide a more comprehensive understanding of what drives heritage protection behaviors. Additionally, qualitative methodologies, such as in-depth interviews or focus groups, could complement the quantitative findings by capturing tourists' personal motivations and experiences, thus offering richer insights into the psychological and emotional drivers behind their willingness to engage in cultural heritage protection.

In conclusion, this study highlights the importance of fostering knowledge sharing, strengthening cultural identity, and enhancing perceived value to encourage proactive heritage protection behaviors. For stakeholders, including policymakers, tourism operators, and community leaders, the results emphasize the need to develop targeted strategies that leverage cultural education, immersive experiences, and community involvement to sustain long-term engagement in cultural heritage conservation. By focusing on these elements, it is possible to create a more sustainable heritage tourism model that not only preserves cultural assets but also enriches the visitors' experience, ultimately contributing to the preservation of cultural heritage for future generations.

Appendix 1. Measurement

Construct	Items	Source
Cultural heritage knowledge sharing	KD1. I often share new insights about the history of Mount Taishan's Zen Buddhism.	Nham et al. (2020)
	KD2. I often share new travel tips about Qianfoshan Xingguo Zen Temple and Wanfo Cave.	
	KD3. I regularly share and shoot videos about Shandong's cultural heritage, such as Confucian temple worship activities.	
	KD4. I frequently share social media, flyers, and travel reviews about the inheritance of Confucian temple culture.	
	KC1. I have always been committed to learning about the poetry culture, ancient architecture, and inscriptions related to Baotu Spring.	
	KC2. I spare no effort to understand the architectural style of the temples in Qianfo Mountain.	
	KC3. I strive to pursue knowledge about the Confucian cultural heritage in Shandong.	

	KC4. I searched in detail for existing reports and official documents related to Shandong cultural heritage such as Confucian temple worship culture.	
	KC5. I thoroughly explored the Buddhist cultural connotation of Qianfo Mountain, Taoist cultural relics of Mount Taishan Mountain and other cultures and images related to Shandong's religious and cultural heritage.	
Cultural heritage protection behaviour	Individuals or groups protect and responsibly manage cultural heritage, thereby minimizing negative impacts on these valuable cultural and historical resources.	Cheng and Chen (2022)
Cultural identity	CR1. I have a deep understanding of the Mount Taishan Fengchan ceremony and Confucius Temple sacrifice, so I can protect Shandong's cultural heritage.	Williams et al. (2018)
	CR2. I am familiar with the ancestral lineage or tribe of the Shun culture in Qianfoshan.	
	CR3. I am very familiar with the legends and stories related to the sacrificial culture of Confucian temples in Shandong.	
	CR4. When visiting Shandong's cultural heritage, I actively participated in traditional ceremonies and activities such as the blessing ceremony of Mount Taishan Mountain and the sacrificial ceremony of Confucius Temple.	
	CR5. The special terminology influenced by Confucian temple culture reflects the roots of Shandong's cultural heritage.	
	CR6. I have a deep understanding of the Taoist belief in Mount Taishan Mountain and the Confucianism in the Confucian Temple.	
	CR7. I can easily use the relevant knowledge of Mount Taishan culture and Confucian temple culture for dialogue.	
	CR8. I have deep contact with the volunteer organizations participating in the protection of Mount Taishan Mountain and the cultural groups of Confucian temple culture lovers.	
	PI1. Cultural values, such as family unity, traditional customs, spiritual life and the sense of responsibility for Mount Taishan's cultural heritage, are crucial for me to protect Shandong's cultural heritage.	
	PI2. When I hear local songs such as "Ship Over Liugong Island" and "Thousand Mountains" from Shandong, I feel proud of my cultural identity.	
	PI3. I often think about the interaction between Taoist beliefs and local customs in Mount Taishan.	
	PI4. People often associate me with those who speak the same Shandong local language and have the same customs and rituals.	
	PI5. For me, it is important to gain recognition and respect from those who participate in the "Nine Nine" Chongyang Mountain Meeting at Qianfo Mountain.	
Perceived value of cultural heritage	FV1. Access to historical and cultural information about Mount Taishan has greatly enriched my knowledge base and helped me protect them.	Liu (2021)
	FV2. My deep understanding of Confucian temple sacrificial culture has allowed me to immerse myself in the etiquette and customs of the region.	
	FV3. The Confucius Festival has awakened my memories of visiting cultural heritage sites in Shandong.	
	EV1. Visiting Confucius Temple takes me back to ancient culture thousands of years ago.	
	EV2. Exploring the Shun culture of Qianfo Mountain has exposed me to a unique culture that is completely different from my previous experiences.	
	EV3. The historical and cultural significance carried by Baotu Spring is both fascinating and captivating.	

	SV1. Sharing Mount Taishan culture and Confucian temple culture has improved my social image and won appreciation for my cultural taste.	
	SV2. I have made contributions to the protection of Shandong's intangible cultural heritage by creating and sharing videos of Qianfo Mountain and Baotu Spring.	
	SV3. I supported the manufacturers of cultural heritage souvenirs in Shandong by purchasing souvenirs related to Mount Taishan and Confucius Temple.	
	RV1. Sharing the Confucian cultural values of the Confucian Temple has strengthened my relationships with others who share similar interests and beliefs.	
	RV2. By promoting Shandong cultural heritage sites such as the Sino Japanese War Memorial Site, Warring States Period Site, and British Concession Period Architecture Site on Liu Gong Island through social media, I have made more friends with people who are interested.	
	RV3. Through a shared interest in Shandong Confucian temple culture, my friendship with friends has been strengthened.	
	PV1. Tours to the three Confucius (Temple and Cemetery of Confucius and the Kong Family Mansion) in Qufu and the Dai Temple in Mount Taishan have promoted the hospitality of the region and helped to establish and strengthen interpersonal relationships.	
	PV2. Although travel incurs expenses, the unique cultural value of Baotu Spring, including its natural scenery, surrounding ancient buildings, and inscriptions, makes it a worthwhile experience.	
	PV3. Based on past experience, the Qianfo Cliff, Buddha statues, and inscriptions on Qianfo Mountain in Shandong not only provide beautiful scenery, but also enrich one's cultural knowledge, making it a valuable investment.	
intention to protect cultural heritage	Be worth protecting	Liu (2021)
	Consider protecting	
	Intend to protect	
Cultural heritage protection behaviour	CB1. I strictly abide by the regulations on protection and management of Mount Taishan Scenic Area, and do not climb, trample, carve or paint cultural relics and historic sites.	Cheng and Chen (2022)
	CB2. I strictly abide by the code of conduct for passengers and do not swim or litter in the spring water to prevent pollution of the water quality in Baotu Spring.	
	CB3. I always remind my companions not to damage trees, smoke or illegally use fire in Liugong Island National Forest Park, in order to avoid causing damage to the scenic area.	

References

- Azzopardi, E., Kenter, J. O., Young, J., Leakey, C., O'Connor, S., Martino, S., Flannery, W., Sousa, L. P., Mylona, D., & Frangoudes, K. (2023). What are heritage values? Integrating natural and cultural heritage into environmental valuation. *People and Nature*, *5*(2), 368-383. https://doi.org/10.1002/pan3.10386
- Cai, Z., Fang, C., Zhang, Q., & Chen, F. (2021). Joint development of cultural heritage protection and tourism: the case of Mount Lushan cultural landscape heritage site. *Heritage Science*, *9*(1), 86. https://doi.org/10.1186/s40494-021-00558-5
- Cheng, Z., & Chen, X. (2022). The effect of tourism experience on tourists' environmentally responsible behavior at cultural heritage sites: The mediating role of cultural attachment. *Sustainability*, *14*(1), 565. https://doi.org/10.3390/su14010565
- Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability,

convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management*, *41*(2), 745-783. https://doi.org/10.1007/s10490-023-09871-y

- Chinese culture newspaper. (2022). The 2021 Statistical Bulletin on Culture and Tourism Development was released. https://cn.chinadaily.com.cn/gtx/5d47c3fba31099ab995d74ba/ccdy/page_44.html
- Cooper, E., Dolnicar, S., & Grün, B. (2024). Understanding how a commitment-based pledge intervention encourages pro-environmental tourist behaviour. *Tourism Management*, *104*, 104928. https://doi.org/10.1016/j.tourman.2024.104928
- Cultural tourism in Shandong. (2022). The provincial Department of Culture and Tourism and other 22 departments jointly issued measures to strengthen the protection of intangible cultural heritage. https://whhly.shandong.gov.cn/
- Ghermandi, A., Camacho-Valdez, V., & Trejo-Espinosa, H. (2020). Social media-based analysis of cultural ecosystem services and heritage tourism in a coastal region of Mexico. *Tourism Management*, *77*, 104002. https://doi.org/10.1016/j.tourman.2019.104002
- Gonçalves, J., Mateus, R., Silvestre, J. D., Roders, A. P., & Bragança, L. (2021). Attitudes matter: Measuring the intention-behaviour gap in built heritage conservation. *Sustainable Cities and Society*, *70*, 102913. https://doi.org/10.1016/j.scs.2021.102913
- Hosen, M., Ogbeibu, S., Lim, W. M., Ferraris, A., Munim, Z. H., & Chong, Y.-L. (2023). Knowledge sharing behavior among academics: Insights from theory of planned behavior, perceived trust and organizational climate. *Journal of Knowledge Management*, *27*(6), 1740-1764. https://doi.org/10.1108/JKM-02-2022-0140
- Krasnokutska, I., Andrenko, I., Cirella, G. T., Radionova, O., Shapovalenko, D., Kraynyuk, L., Kharchenko, O., Kolontaievskyi, O., Bogdan, N., Aleksandrova, S., Balandina, I., & Sokolenko, A. (2024). Sustainable Tourism Development and Strategies in Ukraine: Balancing Environmental, Social, and Economic Dimensions. In G. T. Cirella (Ed.), *Handbook on Post-War Reconstruction and Development Economics of Ukraine: Catalyzing Progress* (pp. 251-270). Springer International Publishing. https://doi.org/10.1007/978-3-031-48735-4_15
- Kunst, J. R., & Mesoudi, A. (2024). Decoding the Dynamics of Cultural Change: A Cultural Evolution Approach to the Psychology of Acculturation. *Personality and Social Psychology Review*, 10888683241258406. https://doi.org/10.1177/10888683241258406
- Lam, L., Nguyen, P., Le, N., & Tran, K. (2021). The Relation among Organizational Culture, Knowledge Management, and Innovation Capability: Its Implication for Open Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 66. https://doi.org/10.3390/joitmc7010066
- Lazar, N., & Chithra, K. (2022). Role of culture in sustainable development and sustainable built environment: a review. *Environment, Development and Sustainability*, *24*(5), 5991-6031. https://doi.org/10.1007/s10668-021-01691-8
- Lee, C.-K., Ahmad, M. S., Petrick, J. F., Park, Y.-N., Park, E., & Kang, C.-W. (2020). The roles of cultural worldview and authenticity in tourists' decision-making process in a heritage tourism destination using a model of goal-directed behavior. *Journal of Destination Marketing & Management*, *18*, 100500. https://doi.org/10.1016/j.jdmm.2020.100500
- Leong, A. M. W., Yeh, S.-S., Zhou, Y., Hung, C.-W., & Huan, T.-C. (2024). Exploring the influence of historical storytelling on cultural heritage tourists' value co-creation using tour guide interaction and authentic place as mediators. *Tourism Management Perspectives*, *50*, 101198. https://doi.org/10.1016/j.tmp.2023.101198
- Li, B., Lu, Y., Li, Y., Zuo, H., & Ding, Z. (2024). Research on the Spatiotemporal Distribution Characteristics and Accessibility of Traditional Villages Based on Geographic Information Systems—A Case Study of Shandong Province, China. *Land*, *13*(7), 1049. https://doi.org/10.3390/land13071049
- Li, H., Kinoshita, T., Chen, J., Xie, J., Luo, S., & Su, D. (2024). What promotes residents' donation behavior for adaptive reuse of cultural heritage projects? An application of the extended theory of planned behavior. *Sustainable Cities and Society*, *102*, 105213. https://doi.org/10.1016/j.scs.2024.105213
- Lin, Z., Wong, I. A., Zhang, G., & Chen, Y. (2022). Longing for the heritage treasure: reconnecting the

self and the heritage site through nostalgic reminiscences and psychological ownership. *Journal of Travel & Tourism Marketing*, *39*(3), 320-334. https://doi.org/10.1080/10548408.2022.2089953

- Liu, H. (2021). Perceived value dimension, product involvement and purchase intention for intangible cultural heritage souvenir. *American Journal of Industrial and Business Management*, *11*(01), 76. https://doi.org/10.4236/ajibm.2021.111006
- Lu, X. (2022). The 14th Five-Year Plan for the Development of Cultural Relics in Shandong Province was released. https://www.thepaper.cn/newsDetail-forward-16351979
- Ma, X., Wang, R., Dai, M., & Ou, Y. (2021). The influence of culture on the sustainable livelihoods of households in rural tourism destinations. *Journal of Sustainable Tourism*, *29*(8), 1235-1252. https://doi.org/10.1080/09669582.2020.1826497
- Mekonnen, H., Bires, Z., & Berhanu, K. (2022). Practices and challenges of cultural heritage conservation in historical and religious heritage sites: evidence from North Shoa Zone, Amhara Region, Ethiopia. *Heritage Science*, *10*(1), 172. https://doi.org/10.1186/s40494-022-00802-6
- Meng, L., Zhu, C., Pu, J., Wen, B., & Si, W. (2022). Study on the Influence Mechanism of Intangible Cultural Heritage Distribution from Man–Land Relationship Perspective: A Case Study in Shandong Province. *Land*, *11*(8), 1225. https://doi.org/10.3390/land11081225
- Moreira, T., Rosário, P., Azevedo, R., Núñez, J. C., & Fuentes, S. (2022). Living on a double-edged sword: Intergenerational perspectives of women from Gypsy groups about the influence of education on cultural identity. *International Journal of Educational Research*, *111*, 101915. https://doi.org/10.1016/j.ijer.2021.101915
- Nham, T. P., Nguyen, T.-M., Tran, N. H., & Nguyen, H. A. (2020). Knowledge sharing and innovation capability at both individual and organizational levels: An empirical study from Vietnam's telecommunication companies. *Management & Marketing*, *15*(2), 275-301. https://doi.org/10.2478/mmcks-2020-0017
- Qu, Z., Cao, X., Ge, H., & Liu, Y. (2021). How does national image affect tourists' civilized tourism behavior? The mediating role of psychological ownership. *Journal of Hospitality and Tourism Management*, *47*, 468-475. https://doi.org/10.1016/j.jhtm.2021.04.019
- Rasoolimanesh, S. M., Iranmanesh, M., Seyfi, S., Ari Ragavan, N., & Jaafar, M. (2022). Effects of perceived value on satisfaction and revisit intention: Domestic vs. international tourists. *Journal of Vacation Marketing*, *29*(2), 222-241. https://doi.org/10.1177/13567667221086326
- Rasoolimanesh, S. M., Seyfi, S., Hall, C. M., & Hatamifar, P. (2021). Understanding memorable tourism experiences and behavioural intentions of heritage tourists. *Journal of Destination Marketing & Management*, *21*, 100621. https://doi.org/10.1016/j.jdmm.2021.100621
- Rese, A., Kopplin, C. S., & Nielebock, C. (2020). Factors influencing members' knowledge sharing and creative performance in coworking spaces. *Journal of Knowledge Management*, *24*(9), 2327-2354. https://doi.org/10.1108/JKM-04-2020-0243
- Ruan, W.-Q., Wang, M.-Y., Zhang, S.-N., Li, Y.-Q., & Su, X. (2024). Knowledge-based or affection-based? The influence mechanism of heritage tourism interpretation content on tourists' willingness to inherit culture. *Tourism Management*, *102*, 104876. https://doi.org/10.1016/j.tourman.2023.104876
- Stoermer, S., Davies, S., & Froese, F. J. (2021). The influence of expatriate cultural intelligence on organizational embeddedness and knowledge sharing: The moderating effects of host country context. *Journal of International Business Studies*, *52*(3), 432-453. https://doi.org/10.1057/s41267-020-00349-3
- Toufighi, S. P., Ghasemian Sahebi, I., Govindan, K., Lin, M. Z. N., Vang, J., & Brambini, A. (2024). Participative leadership, cultural factors, and speaking-up behaviour: An examination of intra-organisational knowledge sharing. *Journal of Innovation & Knowledge*, *9*(3), 100548. https://doi.org/10.1016/j.jik.2024.100548
- Wei, C., Dai, S., Xu, H., & Wang, H. (2020). Cultural worldview and cultural experience in natural tourism sites. *Journal of Hospitality and Tourism Management*, *43*, 241-249. https://doi.org/10.1016/j.jhtm.2020.04.011
- Whiten, A. (2022). Blind alleys and fruitful pathways in the comparative study of cultural cognition. *Physics of Life Reviews*, *43*, 211-238. https://doi.org/10.1016/j.plrev.2022.10.003

- Williams, A. D., Clark, T. C., & Lewycka, S. (2018). The associations between cultural identity and mental health outcomes for indigenous Māori youth in New Zealand. *Frontiers in Public Health*, *6*, 319. https://doi.org/10.3389/fpubh.2018.00319
- Wu, D. (2020). Empirical study of knowledge withholding in cyberspace: Integrating protection motivation theory and theory of reasoned behavior. *Computers in Human Behavior*, *105*, 106229. https://doi.org/10.1016/j.chb.2019.106229
- Xanthakis, M., Simatou, A., Antonopoulos, N., Kanavos, A., & Mylonas, N. (2024). Alternative Forms of Tourism: A Comparative Study of Website Effectiveness in Promoting UNESCO Global Geoparks and International Dark Sky Parks. *Sustainability*, *16*(2). https://doi.org/10.3390/su16020864
- Yang, Y., Wang, S., Cai, Y., & Zhou, X. (2022). How and why does place identity affect residents' spontaneous culture conservation in ethnic tourism community? A value co-creation perspective. *Journal of Sustainable Tourism*, *30*(6), 1344-1363. https://doi.org/10.1080/09669582.2021.1945070
- Yousaf, S., Liu, Y., & Xiang, Y. Tourism and sociocultural identity discourses in ethnic minority communities: a study of she ethnic townships in Zhejiang Province, China. *Journal of Sustainable Tourism*, 1-25. https://doi.org/10.1080/09669582.2024.2347544
- Zhang, J., Xiong, K., Liu, Z., & He, L. (2022a). Research progress and knowledge system of world heritage tourism: a bibliometric analysis. *Heritage Science*, *10*(1), 42. https://doi.org/10.1186/s40494-022-00654-0
- Zhang, J., Xiong, K., Liu, Z., & He, L. (2022b). Research progress on world natural heritage conservation: its buffer zones and the implications. *Heritage Science*, *10*(1), 102. https://doi.org/10.1186/s40494-022-00744-z
- Zhang, S., Xiong, K., Fei, G., Zhang, H., & Chen, Y. (2023). Aesthetic value protection and tourism development of the world natural heritage sites: a literature review and implications for the world heritage karst sites. *Heritage Science*, *11*(1), 30. https://doi.org/10.1186/s40494-023-00872-0
- Zhang, X., & Liu, S. (2021). Understanding relationship commitment and continuous knowledge sharing in online health communities: a social exchange perspective. *Journal of Knowledge Management*, *26*(3), 592-614. https://doi.org/10.1108/JKM-12-2020-0883