Geojournal of Tourism and Geosites
ISSN 2065-0817, E-ISSN 2065-1198

Year XIX, vol. 65, no. 2, 2026, p.1128-1140
DOI 10.30892/gtg.65246-1751

YOUNG TOURISTS' CONSERVATION BEHAVIOR IN WORLD HERITAGE SITES: IMPLICATIONS FOR SUSTAINABLE HERITAGE TOURISM IN NORTHERN VIETNAM

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Citation: Vu, Y.T., Nguyen, N.T.T., & Dinh, H.T. (2026). Young tourists' conservation behavior in world heritage sites: Implications for sustainable heritage tourism in northern Vietnam. *Geojournal of Tourism and Geosites*, 65(2), 1128–1140. https://doi.org/10.30892/gtg.65246-1751

Abstract: This study explores the factors driving world heritage conservation behavior among young tourists in the context of developing countries. Through foundational theories such as the Theory of Planned Behavior, Social Cognitive Theory, and the Stimulus Organism Response, the research model is defined, aiming to examine the influence of reference groups and travel experiences shaping conservation outcomes through cognitive and attitudinal pathways in heritage tourism. The study utilizes a partial least squares structural equation model with cross-sectional data collected. The sample consists of 318 young tourists surveyed directly at three UNESCO World Heritage sites in Northern Vietnam: the Trang An Scenic Landscape Complex, Ha Long Bay, and the Thang Long Imperial Citadel, to ensure representativeness and completeness. The results show that the reference group significantly influences the attitudes, perceptions, and conservation behaviors of young tourists regarding World Heritage sites, while the travel experience influences attitudes and behaviors but not their conservation perceptions. Particularly important is the finding that perceptions predict conservation behavior, while attitudes do not, challenging the conventional notion that emphasizes the emotional attachment of tourists. Mediating analysis demonstrates that perceptions, not attitudes, mediate the effects of the reference group on conservation behavior. These findings advance theoretical understanding by demonstrating the preeminence of perceptions over the formation of supportive attitudes in the context of heritage conservation. This research provides useful scientific documentation for heritage managers, policymakers, and the tourism industry when developing measures and strategies to promote heritage conservation behavior among tourists in the context of sustainable heritage tourism development.

Keywords: world heritage conservation, young tourists, sustainable heritage tourism, PLS-SEM, attitude-behavior gap, Vietnam

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INTRODUCTION

World Heritage Sites (WHS) are among the most valued cultural and natural assets of humanity, recognised under the World Heritage Convention for their Outstanding Universal Value. At the same time, the rapid growth of global tourism has placed increasing pressure on the conservation, authenticity, and integrity of these sites (Rössler, 2023). While tourism generates significant economic benefits, particularly for local communities, it also creates substantial challenges for long-term heritage protection. This tension is especially pronounced in developing countries, where heritage tourism often serves as a key driver of economic growth but is constrained by limited management capacity, infrastructure pressures, and the risks of overtourism (Zhenzhen et al., 2023).

These challenges are clearly visible in Southeast Asia. In Vietnam, eight UNESCO designated cultural and natural WHS attract more than 15 million visitors annually, contributing substantially to local and national economies while simultaneously intensifying conservation pressures (Bui et al., 2018). In response, scholars and practitioners have increasingly called for regenerative and responsibility oriented tourism approaches that view tourists not merely as consumers of heritage experiences, but as active participants in conservation processes (Nian et al., 2025). Understanding why some visitors behave responsibly while others do not has therefore become a central concern in sustainable heritage tourism research.

Young tourists aged 18 to 35, particularly Millennials and Generation Z, represent a critical group in this discussion. Together, they account for approximately 40 percent of global tourism demand and are often characterised as environmentally aware, digitally connected, and supportive of sustainability ideals (Ribeiro et al., 2025; Schönherr & Pikkemaat, 2024; Seyfi et al., 2025; Wu et al., 2023). However, empirical research consistently reveals a gap between stated values and actual behavior. Pro-environmental attitudes do not always translate into conservation-oriented actions, particularly in complex settings such as WHS, where appropriate behavior requires contextual understanding, social coordination, and situational judgement (Juvan & Dolnicar, 2014; Nilsson Vestola & Kirsten, 2025). This persistent attitude-behavior gap raises important questions about how conservation intentions are formed and enacted in heritage tourism contexts.

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Although a substantial body of research has examined sustainable tourism behavior and environmentally responsible travel, several limitations remain. Many studies focus on individual determinants such as environmental knowledge, place attachment, or visitor satisfaction in isolation, rather than examining how these elements interact within broader cognitive and social processes (Xiaoying & Chen, 2023). Social influence is frequently acknowledged as important, yet the mechanisms through which reference groups, including tour guides, heritage managers, local communities, and social media influencers, shape conservation-related awareness and behavior among young tourists remain insufficiently understood (Alzghoul et al., 2024; Hua et al., 2024). Moreover, while tourism experiences are widely recognised as opportunities for learning, the processes through which these experiences foster lasting conservation behavior in WHS contexts are still underexplored (Chuamuangphan et al., 2025; Nian et al., 2025).

More broadly, existing research has tended to emphasise attitudinal explanations of conservation behavior, drawing heavily on the Theory of Planned Behavior (TPB). While TPB provides a robust theoretical foundation, recent evidence suggests that cognitive factors, particularly knowledge-based understanding of heritage values, threats, and management practices, may play a more decisive role than attitudes alone in complex heritage settings, where conservation challenges are often less visible or immediately apparent (Ghosh et al., 2025; Wang et al., 2025). Although heritage-related knowledge has been addressed in environmental and sustainability research, its role in shaping the relationship between awareness and actual conservation behavior remains insufficiently developed within heritage tourism scholarship (Orts-Cardador et al., 2024).

To address these gaps, this study develops an integrated analytical framework that combines the Stimulus–Organism–Response (S-O-R) model, the Theory of Planned Behavior, and Social Cognitive Theory (SCT). Within this framework, reference group influence and tourism experience are conceptualised as external stimuli that shape visitors' internal cognitive and attitudinal states, which in turn influence conservation behavior. This integrated approach enables the simultaneous examination of direct effects, mediating mechanisms, and moderating conditions, thereby offering a more nuanced understanding of how young tourists engage with conservation in WHS.

Based on these gaps, this study seeks to answer three key research questions:

RQ1: How do reference groups influence young tourists' conservation attitudes, awareness, and behaviors?

RQ2: Do conservation attitudes and awareness mediate the relationships between reference groups, tourism experiences, and conservation behaviors?

RQ3: Does conservation knowledge moderate the relationships between attitudes, awareness, and conservation behaviors?

Methodologically, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyse survey data collected from 318 young tourists at three UNESCO WHS in northern Vietnam: the Trang An Scenic Landscape Complex, Ha Long Bay, and the Central Sector of the Imperial Citadel of Thang Long. Examining multiple sites enhances the generalisability of the findings across different heritage contexts, while the use of PLS-SEM allows for robust testing of complex mediation and moderation relationships within the proposed theoretical framework.

By focusing on young tourists in a developing country context, this research contributes to heritage tourism scholarship in several important ways. It advances theoretical understanding by integrating social influence, experiential learning, and cognitive mechanisms within a single explanatory model. It also clarifies the conditions under which awareness translates into conservation behavior, highlighting the moderating role of heritage-related knowledge.

Finally, the findings offer practical implications for heritage managers and policymakers, suggesting that strategies grounded in social reference mechanisms and knowledge-oriented interventions may be more effective than attitude-focused campaigns alone. Given the growing influence of young tourists as future cultural consumers and decision-makers, such insights are essential for supporting long-term sustainability in World Heritage tourism, particularly in the Global South. The remainder of the paper is organised as follows. Section 2 reviews the relevant literature on WHS conservation behavior, establishes the theoretical foundations, and develops the research hypotheses.

Section 3 outlines the research methodology, including sampling procedures, measurement instruments, and analytical techniques. Section 4 presents the empirical results from the PLS-SEM analysis, including tests of direct, mediating, and moderating effects. The final section discusses the theoretical and practical implications of the findings, acknowledges study limitations, and suggests directions for future research.

LITERATURE REVIEW

1. Theoretical Foundations of Young Tourists' World Heritage Conservation Behavior

Understanding young tourists' conservation behavior requires the integration of multiple behavioral theories, primarily the TPB, SCT, and the S-O-R model. Together, these theories provide a comprehensive framework encompassing cognitive, social, and environmental dimensions of conservation behavior.

Theory of Planned Behavior

The TPB is one of the most widely applied frameworks for explaining pro-environmental and tourism-related behavior (Ajzen, 1991). TPB posits that behavioral intention is shaped by attitude, subjective norm, and perceived behavioral control. Numerous studies have confirmed its predictive value across tourism, hospitality, and environmental management contexts (Han, 2015; Lee et al., 2021). In heritage tourism, attitude reflects tourists' favourable evaluations of heritage protection, subjective norm captures perceived social pressure to behave responsibly, and perceived behavioural control represents individuals' perceived ability and resources to perform conservation behaviors. Among young tourists, attitudes have been shown to strongly predict behavioral intention (Zhang & Ran, 2024) while subjective norms may exert a weaker influence due to greater generational independence (Wu et al., 2023). Nevertheless, perceived behavioral control remains a

robust determinant of environmentally responsible behavior, particularly when young tourists evaluate their capacity to contribute to heritage conservation. Despite its strengths, TPB primarily focuses on individual cognitive processes and does not fully capture the social learning mechanisms and normative influences that shape behavior in collective tourism settings. While young tourists are embedded in social networks, observe peer behavior, and are influenced by social media and reference groups. To address these limitations, Social Cognitive Theory provides essential complementary insights.

Social Cognitive Theory

The SCT developed by Bandura (1986) emphasizes reciprocal determinism, whereby personal factors, environmental influences, and behavior continuously interact (Bandura, 1986). In the context of heritage tourism, SCT explains how observational learning, self-efficacy, and outcome expectations shape conservation behavior. Young tourists learn sustainable norms through peers, role models, and digital platforms, and are more likely to adopt pro-conservation actions when such behaviors are socially reinforced (D'Arco et al., 2025; Xu et al., 2020). SCT, therefore, highlights the importance of social learning and normative influence in shaping young tourists' WHC behavior.

However, both TPB and SCT pay limited attention to how external environmental stimuli, such as on-site tourism experiences or interpretive encounters, activate internal psychological states that precede behavioral responses. To address this gap, the S-O-R model offers a third and complementary theoretical perspective.

Stimulus Organism Response (S-O-R) model

Originally proposed by Mehrabian and Russell (1974), the S-O-R model explains how external stimuli influence internal psychological states, which subsequently trigger behavioral responses (Mehrabian & Russell, 1974). In tourism research, the S-O-R framework has been widely applied to link destination experiences and environmental cues with emotions, attachment, and responsible behavior (Nian et al., 2025; Sharma et al., 2024; Zhu et al., 2025). In World Heritage contexts, stimuli such as tourism experiences and reference group messages shape tourists' internal cognitive and affective states, including awareness and attitudes, which then influence conservation behavior.

By incorporating S-O-R framework, this study acknowledges that cognitive evaluations (TPB) and social learning processes (SCT) are activated and shaped by environmental stimuli encountered during heritage tourism experiences.

Taken together, TPB explains the cognitive drivers of behavioral intention, SCT clarifies how these drivers are reinforced through social learning and normative influence, while the S-O-R model explains when and why internal psychological mechanisms are activated by external stimuli. Integrating these theories provides a holistic framework for understanding the complex pathways through which young tourists form and enact conservation behaviors at WHS.

2. World Heritage Conservation in the Tourism Context

Concept and Significance of World Heritage Conservation.

The UNESCO World Heritage Convention defines WHS as places of Outstanding Universal Value deserving protection for present and future generations. World Heritage Conservation, therefore, involves identifying, preserving, and managing irreplaceable cultural and natural assets (Yang et al., 2010). In tourism contexts, World Heritage conservation depends not only on institutional policies and site management but also on the behaviors of visitors themselves. Tourist actions can either support or undermine conservation efforts, making visitor engagement a critical component of sustainable heritage management.

Conceptualizing World Heritage Conservation Behavior

World Heritage Conservation (WHC) Behavior refers to deliberate actions undertaken by tourists to protect, preserve, and support the sustainability of WHS during and after their visits. Prior research on pro-environmental behavior and heritage tourism suggests that WHC behavior extends beyond tourists' responsible conduct at heritage sites to include broader supportive actions related to heritage conservation (Chen & Tung, 2014).

Specifically, WHC behavior comprises two complementary dimensions: (i) Direct conservation behaviors include on-site actions such as avoiding physical damage to heritage structures and natural environments, proper waste disposal, conserving water and energy, complying with site regulations, respecting cultural norms, and choosing environmentally responsible transport and services. (ii) Indirect conservation behaviors involve off-site support, including donating to conservation initiatives, volunteering for heritage preservation, advocating for conservation policies, disseminating conservation messages through word-of-mouth and social media, and supporting tourism operators committed to sustainable practices. WHS play a dual role by generating economic opportunities while requiring strict protection to maintain authenticity and integrity. Tourism can enhance awareness and financial support for conservation, but it can also generate threats such as overtourism, cultural commodification, and environmental degradation (Rössler, 2023).

In developing countries, heritage tourism provides critical income but often exceeds management capacity (Zhenzhen et al., 2023). Sustainable management, therefore, requires balancing conservation imperatives with economic pressures, particularly in rapidly developing destinations such as Vietnam.

3. Young Tourists and Generational Differences in Conservation Behavior

Young tourists, including Millennials and Generation Z, represent the largest and most dynamic tourist segment globally. Research indicates that these generations express strong environmental concern, heightened climate risk perception, and active engagement in sustainability-related communication (Lotfavi et al., 2025; Poortinga et al., 2023; Ribeiro et al., 2025; Swim et

al., 2022; Tyson et al., 2021). Generational theory suggests that Millennials and Gen Z are generally cooperative, socially responsible, and emotionally responsive compared to previous cohorts (Howe & Strauss, 1992). Empirical studies confirm young tourists' tendency toward resource conservation and support for local communities (Nilsson Vestola & Kirsten, 2025; Pulido-Fernández et al., 2024; Schönherr & Pikkemaat, 2024). However, evidence also indicates inconsistencies between stated environmental concern and actual behavioral choices, particularly when economic considerations such as price are involved (Seyfi et al., 2025). Moreover, urban lifestyles and digital immersion may weaken emotional connections with natural environments, potentially reducing direct conservation actions (Pokhrel et al., 2025; Straka et al., 2025). At the same time, experiential learning and digital tools, including virtual heritage interpretation and gamified education, have been shown to enhance awareness and behavioral commitment (Nian et al., 2025; Wang et al., 2025). These contrasting tendencies position young tourists as both promising and paradoxical actors in WHC.

4. Factors influencing Young Tourists' WHC Behaviors

Young tourists' WHC behavior is shaped by a combination of cognitive understanding, emotional connection, and perceived ability to act. These factors are influenced by environmental and conservation education, as well as participation facilitated through both traditional and digital media (Wu et al., 2023).

World Heritage Tourism Experience

From an S-O-R perspective, tourism experiences act as environmental stimuli that shape internal psychological responses and subsequent behavior. Authentic, educational, and emotionally engaging tourism experiences enhance tourists' appreciation of heritage value, strengthen attachment, and encourage conservation behavior (Xiaoying & Chen, 2023). Previous studies demonstrate that meaningful cultural learning, satisfaction, and perceived authenticity reinforce pro-environmental attitudes and sustainable behavior (Sthapit et al., 2023; Zhou & Ramli, 2025; Zhu et al., 2025).

Accordingly, the following hypotheses are proposed:

H1a: World Heritage tourism experience positively influences young tourists' WHC attitudes.

H1b: World Heritage tourism experience positively influences young tourists' WHC awareness.

H1c: World Heritage tourism experience positively influences young tourists' WHC behaviors.

Influence of Reference Groups

Reference groups, including tour guides, site managers, local communities, and online influencers, function as key transmitters of conservation norms (de Oliveira et al., 2024).

SCT explains reference group influence through observational learning, modeling, and social reinforcement. Interpretation and education provided by guides improve understanding and compliance (Alzghoul et al., 2024), while community involvement fosters conservation in supportive environments (Rasoolimanesh et al., 2017). Digital influencers also shape sustainable consumption patterns among young tourists (Juma-Michilena et al., 2024; Liao, 2024).

Social pressure and social networks further influence environmentally responsible behavior among Millennials and Gen Z (D'Arco et al., 2025; Schönherr & Pikkemaat, 2024). However, empirical findings remain mixed, with some studies suggesting that younger generations may exhibit weaker conservation behavior than older cohorts (Seyfi et al., 2025; Wiernik et al., 2016). Based on these arguments, the following hypotheses are proposed:

H2a: Reference groups positively influence young tourists' WHC attitudes.

H2b: Reference groups positively influence young tourists' WHC awareness.

H2c: Reference groups positively influence young tourists' WHC behaviors.

Influence of WHC Attitudes and Awareness

According to the S-O-R framework, internal psychological states mediate the relationship between environmental stimuli and behavioral responses. In this study, WHC attitudes and awareness represent complementary internal states linking external stimuli to conservation behavior. Empirical research indicates that sustainability awareness and positive attitudes enhance conservation-oriented actions (Diallo et al., 2022; Pai et al., 2025). Awareness of heritage value and authenticity enables tourists to cognitively evaluate conservation importance, motivating WHC behavior (Dai et al., 2021).

Accordingly, this study proposes:

H3: WHC attitudes positively influence young tourists' WHC behaviors.

H4: WHC awareness positively influence young tourists' WHC behaviors.

Mediating Role of WHC Attitudes and Awareness

From a TPB perspective, attitudes serve as proximal determinants of behavior, while tourism experiences and reference groups operate as distal factors influencing behavior indirectly. Previous studies suggest that attitudes and awareness mediate the relationship between environmental stimuli and behavioral outcomes (Alazaizeh, 2014; Diallo et al., 2022; Nian et al., 2025). However, such mechanisms remain underexplored among young tourists in developing country contexts.

Accordingly, the following hypotheses are proposed:

H5a, b: WHC Attitude plays a mediating role, conveying the positive impact of WH Tourism Experience and Reference Group on young tourists' WHC behaviors.

H6a, b: WHC Awareness plays a mediating role, conveying the positive impact of WH Tourism Experience and Reference Group on young tourists' WHC behaviors.

Moderating Role of WHC Knowledge

While attitudes and awareness directly influence conservation behavior, the strength of these relationships may vary according to individuals' WHC knowledge. Knowledge enhances the ability to translate intention into action by strengthening understanding of heritage values and conservation principles (Dai et al., 2021; Dewu & Røskaft, 2018). Young tourists, in particular, may acquire WHC knowledge through education and digital information sources, enabling more informed conservation behavior (Wu et al., 2023). Accordingly, this study proposes:

H7a: WHC Knowledge moderates the relationship between young tourists' WHC attitudes and WHC behaviors.

H7b: WHC Knowledge moderates the relationship between young tourists' WHC awareness and WHC behaviors.

Based on these hypotheses, a conceptual research model is proposed and presented in Figure 1, illustrating the hypothesised relationships among the study variables.

METHODOLOGY

1. Measurements

All concepts were measured using established scales adapted from previous studies and adapted to the WHC context. Reference Groups influence was adapted from (D'Arco et al., 2025). WH Tourism Experience was taken from Nian et al. (2025). WHC Attitudes was adapted from Ajzen's (1991) Theory of Planned Behavior scale. WHC awareness was developed based on WHC literature (Dai et al., 2021). WHC Behaviors was adapted from (Chen & Tung, 2014), which have been validated in heritage tourism contexts. The measurement scale captures both direct and indirect conservation behaviors. WHC Knowledge (8 items) was adapted from Dai et al. (2021). All reflective constructs used a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The English questionnaire was translated into Vietnamese to ensure semantic equivalence. A pilot study (n = 30) conducted in December 2024 confirmed the clarity of the questionnaire and acceptable internal consistency (Cronbach's α = 0.82-0.91). To address the standard method bias inherent in self-report surveys, we implemented several countermeasures (Podsakoff et al., 2012). Procedurally, we employed a split-time approach, placing knowledge items at the beginning of the questionnaire and behavior items at the end.

We also used different response formats across constructs, ensured explicit anonymity, and randomized the order of items. Statistically, Harman's single-factor test revealed that the first factor explained only 38.6% of the variance (below the 50% threshold), and marker variable analysis confirmed that the substantive relationships remained significant after controlling for theoretically irrelevant items, suggesting that standard method variance did not seriously bias the results.

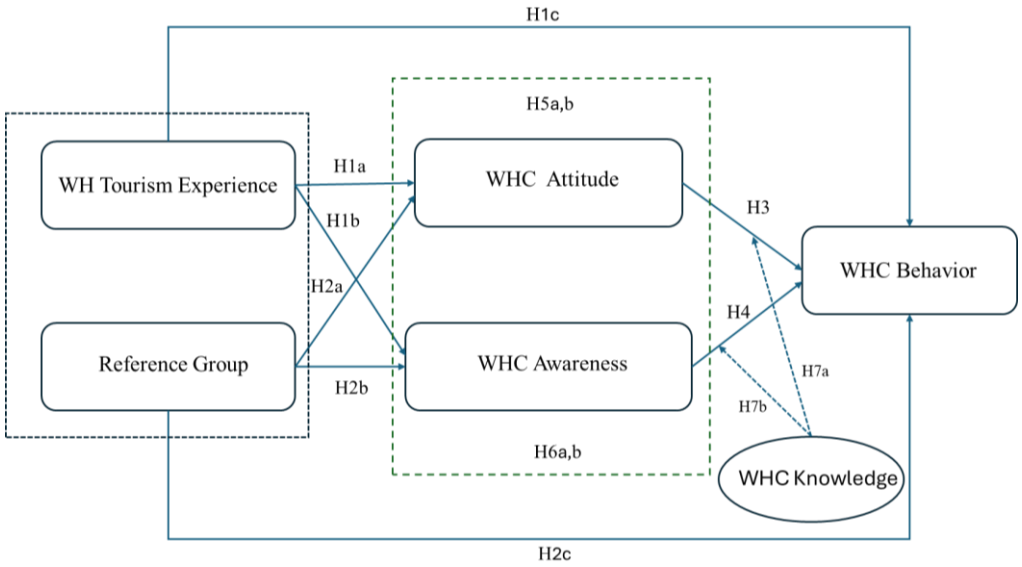

Figure 1. Proposed research model

2. Sampling and Data Collection

The target population consisted of young domestic tourists (Vietnamese citizens aged 18-35) visiting WHS in Northern Vietnam. Data were collected at three UNESCO sites: Trang An Scenic Landscape Complex (mixed site), Ha Long Bay (natural site), and Thang Long Imperial Citadel (cultural site). These sites were selected due to their diverse site types, high visitor numbers (>2 million per year), and active conservation programs (Bui et al., 2018; Tran, 2019). The study used a purposive non-probability sampling method with systematic selection protocols. Although probability sampling would have been ideal, practical constraints at the sites, including the lack of visitor sampling frames and dispersed entry points, forced us to adopt this method. To increase representativeness, we stratified by time (weekdays and weekends during the peak season of January and February 2025), spatial distribution (multiple locations within each heritage site), and system selection (one in three visitors was aged 18–35). Screening criteria required participants to have completed a heritage site visit.

The sample size was determined following the PLS-SEM guidelines of Hair et al (2019) and G*Power 3.1 analysis, which showed that 85 cases were needed to have sufficient statistical power (0.80) to detect medium effect sizes ($f^2 = 0.15$) at $\alpha = 0.05$ (Cohen, 2013). A total of 400 questionnaires were distributed in person at the three WHS mentioned above, and visitor

participation was completely voluntary and anonymous. A total of 318 valid questionnaires were collected, representing a response rate of 79.5% (Appendix A). Post-hoc comparisons with national statistics revealed demographic similarities, although our sample exhibited higher levels of education, reflecting a self-selection bias towards educated respondents willing to complete academic surveys. Collected data was cleaned and processed on Smart PLS-SEM version 4.0.9.2 software.

3. Data analysis

The authors chose PLS-SEM to analyze the research data. The PLS-SEM model is suitable for studies that aim to test the mediation relationship (Rigdon et al., 2017). This study predicts the existence of a mediation relationship from heritage tourism experience and reference groups to WHC behaviors of young tourists. The mediating role of attitudes and awareness of world heritage values in the relationship between heritage tourism experience and reference groups to WHC behaviors of young tourists has not been tested in previous studies. Therefore, this study aims to develop the SOR theory, rather than merely confirm it. To analyze the survey data using the PLS-SEM model, the specific steps are as follows: First, the measurement model is tested to assess the internal consistency reliability, convergent validity, and discriminant validity of the scales. Second, bootstrapping analysis with 5,000 returned samples was performed to test the research hypotheses and estimate the impact coefficient of the structural model (Hair et al., 2019). Finally, path modeling analysis was performed to assess the effect of the mediating variable.

RESULTS

1. Evaluating the measurement model. Assessing internal consistency reliability

The results of the measurement model analysis are presented in Table 2.

This study used factor loadings, Cronbach's alpha coefficients, and composite reliability (CR) values to evaluate the measurement model and verify the internal consistency reliability of the constructs. According to Hair et al (2019), the external loading of each item must be greater than 0.708, while the Cronbach's alpha coefficient and CR value must be greater than 0.70. Table 2 shows that all 21 items have external loadings higher than 0.708. The results of the model analysis show that the Cronbach's alpha values range from 0.87 to 0.922, and the CR values range from 0.871 to 0.922. Thus, all constructs meet the statistical requirements for internal consistency reliability.

Evaluating convergence

The average variance extracted (AVE) values were used to assess the convergent validity of the scales. Table 3 shows that all seven constructs have AVE values ranging from 0.722 to 0.812, exceeding the threshold of 0.50. Thus, the scales in the model satisfy the requirements of convergent validity (Hair et al., 2019).

Table 2. Results of estimating the reflective measurement model

	Measurement Items	Outer Loading	Cronbach's alpha	CR	AVE	Outer VIF
Reference Groups	RG1	0.870	0.911	0.916	0.738	2.652
	RG2	0.877				2.774
	RG3	0.886				3.227
	RG4	0.850				2.393
	RG5	0.811				2.359
WH Tourism Experience	EX1	0.827	0.895	0.902	0.761	2.060
	EX2	0.886				2.801
	EX3	0.901				2.935
	EX4	0.874				2.355
WHC Attitudes	AC1	0.916	0.922	0.922	0.812	4.028
	AC2	0.844				2.114
	AC3	0.926				4.037
	AC4	0.917				4.239
WHC Awareness	AW1	0.793	0.886	0.888	0.747	1.739
	AW2	0.870				2.429
	AW3	0.884				3.085
	AW4	0.906				3.289
WHC Behaviors	BE1	0.857	0.87	0.871	0.722	2.493
	BE2	0.773				1.586
	BE3	0.880				2.536
	BE4	0.883				2.694

Evaluating the discriminant validity

This study uses the Fornell & Larcker (1981) criterion and the Monotrait-Hypothesized-Theory (HTMT) ratio to determine the discriminant validity of latent variables. The discriminant validity of latent variables is satisfied when the square root of AVE for each latent variable is higher than the other correlation values among other constructs (Fornell & Larcker, 1981; Hair et al., 2019). Table 3 shows that the Fornell & Lacker values of all five research constructs are always greater than their corresponding row and column values. In addition, the HTMT coefficient (Table 4) of each construct has a value lower than 0.9, confirming the discriminant validity of the latent variables (Henseler et al., 2015). Therefore, all

five latent constructs of the research model satisfy the requirement of discriminant validity. Thus, this measurement model satisfies the requirement of discrimination, by both the Fornell & Larcker (1981) assessment criteria and the HTMT index.

Table 3. Evaluating the discriminant validity using Fornell & Larcker criteria

	Reference Groups	WH Tourism Experience	WHC Attitudes	WHC Awareness	WHC Behaviors
Reference Groups	**0.859**				
WH Tourism Experience	0.735	**0.873**			
WHC Attitudes	0.809	0.779	**0.901**		
WHC Awareness	0.628	0.522	0.680	**0.864**	
WHC Behaviors	0.748	0.709	0.760	0.721	**0.850**

Table 4. Evaluating the discriminant validity using HTMT criteria

	Reference Groups	WH Tourism Experience	WHC Attitudes	WHC Awareness	WHC Behaviors
Reference Groups	-				
WH Tourism Experience	0.810	-			
WHC Attitudes	0.877	0.849	-		
WHC Awareness	0.690	0.584	0.753	-	
WHC Behaviors	0.836	0.799	0.845	0.819	-

2. Evaluating the SEM structural model

2.1 Path Analysis and Hypothesis Testing

The results of the structural model analysis in Figure 2 provide significant insights into the relationships between the Reference groups, the WH tourism experience, and the WHC behaviors. Table 5 presents the path coefficients, statistical significance levels, effect sizes, and multicollinearity assessments for all hypothesized relationships.

Reference Groups Effects

The model analysis results show that the reference groups have a significant influence on all three WHC dimensions. The relationship between reference groups and WHC attitude ($\beta = 0.515$, $t = 8.662$, $p < 0.001$) shows the most substantial direct effect in the model, with a large effect size ($f^2 = 0.449$). This finding is consistent with social influence theory, which suggests that the opinions of friends and social networks play an important role in shaping individuals' attitudes towards WHC. Reference groups also significantly influence WHC perceptions ($\beta = 0.530$, $t = 7.682$, $p < 0.001$) with a medium effect size ($f^2 = 0.216$), suggesting that social learning mechanisms facilitate the acquisition of WHC knowledge. Notably, the reference groups exhibited a direct positive effect on WHC behaviors ($\beta = 0.494$, $t = 9.513$, $p < 0.001$), although the effect size was smaller ($f^2 = 0.058$). This direct effect of reference groups on WHC behaviors suggests that social pressure and normative expectations from reference groups can promote conservation actions, independent of attitudinal or cognitive mediators, supporting social cognitive theory's emphasis on reference groups' observational learning.

WH Tourism Experience Effects

The relationship between WH tourism experience and WHC attitudes was statistically significant and positive ($\beta = 0.401$, $t = 6.499$, $p < 0.001$) with a medium effect size ($f^2 = 0.273$). This result suggests that direct exposure to WHS increases young tourists' emotional attachment and favorable evaluations. However, the relationship between WH Tourism Experience and WHC awareness was not statistically significant ($\beta = 0.133$, $t = 1.837$, $p = 0.066$), suggesting that mere exposure to heritage does not automatically translate into deeper understanding or knowledge acquisition. Meanwhile, the relationship between WH tourism experience and WHC behaviors ($\beta = 0.346$, $t = 6.100$, $p < 0.001$, $f^2 = 0.072$) was statistically significant at the 1% level, demonstrating that experiential learning through tourism can directly promote WHC actions. This finding suggests that hands-on experiences create lasting behavioral changes even when WHC awareness may not change.

Attitudes and Awareness of WHC

The analysis results show an interesting pattern in the relationship between young tourists' attitudes and behaviors. Contrary to the prediction of the TPB, attitudes about WHC did not significantly predict young tourists' WHC behaviors ($\beta = 0.143$, $t = 1.768$, $p = 0.077$). This result suggests the existence of an attitude-behavior gap, commonly observed in the environmental psychology literature, where positive attitudes do not necessarily translate into corresponding behaviors due to cost or social constraints. In contrast, the analysis results show that there is a significant positive relationship between WHC awareness and WHC behaviors ($\beta = 0.350$, $t = 4.869$, $p < 0.001$, $f^2 = 0.216$). Thus, knowledge and understanding of WHC issues act as stronger predictors of actual WHC behaviors than attitudinal assessments. This finding highlights the importance of conservation education and information dissemination measures in promoting WHC actions.

2.2. Multicollinearity Assessment

All the variance inflation factor (VIF) values were less than 5.0, indicating that multicollinearity is not a concern in the structural model. Thus, the research model ensures the reliability and validity of the path coefficient estimates; the research model does not have multicollinearity (Hair et al., 2019).

Table 5. SEM structural model estimation results

	Path coefficient	Standard deviation	t - values	P- values	Conclusion Hypothesis	Value f^2	Degree of influence	Inner VIF
Reference Groups → WHC Attitudes	0.515	0.059	8.662	0.000	Accepted	0.449	Large	2.173
Reference Groups → WHC Awareness	0.530	0.069	7.682	0.000	Accepted	0.216	Medium	2.173
Reference Groups → WHC Behaviors	0.494	0.052	9.513	0.000	Accepted	0.058	Small	3.268
WH Tourism Experience → WHC Attitudes	0.401	0.062	6.499	0.000	Accepted	0.273	Medium	2.173
WH Tourism Experience → WHC Awareness	0.133	0.072	1.837	0.066	Rejected	0.014	No significant	2.173
WH Tourism Experience → WHC Behaviors	0.346	0.057	6.100	0.000	Accepted	0.072	Small	2.779
WHC Attitudes → WHC Behaviors	0.143	0.081	1.768	0.077	Rejected	0.016	No significant	4.261
WHC Awareness → WHC Behaviors	0.350	0.072	4.869	0.000	Accepted	0.216	Medium	1.934

2.3 Model explanatory power

The coefficient of determination (R^2) shows different levels of explanatory power across the endogenous constructs (Table 6). This result demonstrates the effectiveness of the model in explaining variance across different dimensions of WHCc outcomes. WHC attitudes exhibit the highest explanatory power ($R^2 = 0.729$), with reference groups and WH tourism experience explaining 72.9% of the variance in attitudes. WHC behaviors exhibit similarly strong explanatory power ($R^2 = 0.708$), indicating that the structural model accounts for 70.8% of the variance in behavior.

Both constructs exceed the high explanatory power threshold (R2>0.67), confirming the strong predictive power of the research model (Hair et al., 2019). WHC awareness showed moderate explanatory power ($R^2 = 0.402$), with 40.2% of the variance explained by the antecedent variables (Cohen, 2013). The minimal difference between the R^2 and adjusted R^2 values (0.002–0.004) indicates model parsimony without overfitting.

Table 6. Explanatory power of endogenous constructs (R^2 values)

Endogenous construct	R^2	Adjusted R^2	Explanatory power
WHC Attitudes	0.729	0.727	High
WHC Awareness	0.402	0.398	Medium
WHC Behaviors	0.708	0.704	High

3. Analyze the role of mediating variables

The mediation analysis examines indirect effects between exogenous variables and WHC behaviors through potential mediators (Table 7). Reference groups showed a significant partial mediating effect through WHC awareness ($\beta = 0.185$, $t = 4.095$, $p < 0.001$). Comparing the direct effect ($\beta = 0.494$) with the indirect effect ($\beta = 0.185$), WHC awareness partially mediated the relationship between reference groups and behaviors, suggesting that social influence operates both directly and through improved conservation knowledge. In contrast, the indirect effect through WHC attitudes was insignificant ($\beta = 0.074$, $t = 1.675$, $p = 0.094$), confirming no mediating effect through the attitude pathway. In contrast, World Heritage tourism experience did not show a significant mediating effect through either pathway. The indirect effects through WHC perceptions ($\beta = 0.046$, $t = 1.767$, $p = 0.077$) and WHC attitudes ($\beta = 0.057$, $t = 1.729$, $p = 0.084$) were both statistically insignificant, suggesting that tourism experience influences behavior directly rather than through cognitive or attitudinal mediating processes. Mediation analysis revealed that only the cognitive pathway acted as a significant mediating mechanism, especially for the influence of the reference group. This finding supports cognitive mediation models while challenging traditional attitudinal mediation frameworks in the context of heritage conservation.

Table 7. Estimation results in the structural model with mediating variables

Hypoth	Indirect paths	Direct Paths		Indirect Paths			Intermediate effect
		Path coefficient	P - values	Path coefficient	P - values	t- values	
H6b	Reference Groups → WHC Awareness → WHC Behaviors	0.494	0	0.185	0	4.095	Partial mediator
H5b	Reference Groups → WHC Attitudes →WHC Behaviors	0.494	0	0.074	0.094	1.675	No mediation
H6a	WH Tourism Experience → WHC Awareness → WHC Behaviors	0.346	0	0.046	0.077	1.767	No mediation
H5a	WH Tourism Experience → WHC Attitudes → WHC Behaviors	0.346	0	0.057	0.084	1.729	No mediation

Table 8. Results of the Moderation effects

Hypoth		Original sample	Sample mean	Standard deviation	T-statistics	P- values	Results
	WHC Knowledge → WHC Behaviors	-0.156	-0.141	0.085	1.846	0.065	
H7a	WHC Knowledge x WHC Attitudes → WHC Behaviors	-0.058	-0.067	0.035	1.664	0.096	Rejected
H7b	WHC Knowledge x WHC Awareness → WHC Behaviors	0.077	0.083	0.036	2.122	0.034	Supported

4. The Moderating Effect of WHC Knowledge

Moderation analysis examined whether WHC knowledge moderated the relationship between WHC constructs and WHC behaviors (Table 8). The results of the analysis showed that the direct moderating effect of WHC knowledge on WHC behavior was insignificant (β = -0.156, t = 1.846, p = 0.065), indicating that WHC knowledge does not independently moderate conservation behaviors at the conventional significance level ($p < 0.05$). Meanwhile, WHC knowledge exhibited a significant positive moderating effect on the WHC perception-behavior relationship (β = 0.077, t = 2.122, p = 0.034). This suggests that higher levels of WHC knowledge promote a positive relationship between conservation perceptions and actual WHC behaviors. Knowledgeable individuals are more likely to translate their perceptions into specific conservation actions. On the contrary, the analysis results showed that WHC knowledge did not play a moderating role in the WHC attitudes-behaviors relationship (β = -0.058, t = 1.664, p = 0.096). This insignificant interaction effect suggests that WHC knowledge does not affect how attitudes translate into WHC behaviors. Thus, in this research model, WHC knowledge plays a moderating role, strengthening the WHC cognition-behaviors relationship and contributing to the effectiveness of conservation awareness in promoting behavior in individuals with better knowledge about WHC.

DISCUSSION AND IMPLICATIONS

Discussion about key findings

This study yielded several important findings on the determinants of young tourists' WHC behaviors.

First, reference groups had a significant impact on all three dimensions of WHC, with reference groups having the most substantial impact on attitudes (β = 0.515, t = 8.662, $p < 0.001$, f^2 = 0.449), a moderate impact on cognitions (β = 0.530, t = 7.682, $p < 0.001$, f^2 = 0.216), and a direct impact on behavior (β = 0.494, t = 9.513, $p < 0.001$, f^2 = 0.058), providing evidence that social influence operates more effectively through emotional and behavioral channels than cognitive formation. This is consistent with TPB theory in studies of pro-environmental behaviors, where subjective norms are often found to be an important factor (Fishbein & Ajzen, 1977; Wu et al., 2023). This result reinforces social influence theory, which emphasizes the role of friends, peer networks, and social norms in shaping conservation behaviors (Alzghoul et al., 2024; Li & Wu, 2020). This is especially true for younger tourists, who are highly influenced by beliefs, values, and social influences in shaping sustainable behaviors (Schönherr & Pikkemaat, 2024).

Second, the study found a clear positive impact of travel experience on both attitudes (β = 0.401, t = 6.499, $p < 0.001$, f^2 = 0.273) and behaviors (β = 0.346, t = 6.100, $p < 0.001$, f^2 = 0.072), but no significant impact on cognition (β = 0.133, t = 1.837, $p > 0.05$). This suggests that real-life experiences increase emotional attachment and motivate action, but do not necessarily improve understanding. This finding is consistent with the study of Nian et al., (2025), emphasizing that travel experiences increase emotions and satisfaction, thereby influencing behaviors rather than changing knowledge and awareness. This suggests that experiences can stimulate emotions, positive evaluations, and encourage practical action without necessarily enhancing knowledge or understanding. However, this finding contrasts with previous studies (Carreira et al., 2022; Dai et al., 2021; Li & Wang, 2023), who found that heritage tourism experiences positively influence visitors' conservation intentions by reinforcing their perceptions of heritage authenticity, promoting emotional attachment to the site, and helping to raise awareness and shape visitors' conservation intentions. This can be explained within the context of a developing country, where low economic conditions hinder awareness-raising measures, yet provide visitors with an understanding of the WHS at the site itself.

Third, the study noted a gap between attitudes and behavior: attitudes did not have a significant direct impact on WHC behaviors (β = 0.143, t = 1.768, $p > 0.05$), while awareness was a strong predictor (β = 0.350, t = 4.869, $p < 0.001$, f^2 = 0.216). This result is consistent with previous studies, which showed that although many tourists expressed attitudes and a desire to practice environmentally friendly behavior, the actual practice of such behaviors was much lower (Bergin-Seers & Mair, 2009; Juvan & Dolnicar, 2014). This is consistent with environmental psychology research on the existence of an attitude-behavior gap, that people with positive attitudes do not engage in corresponding behaviors due to practical barriers, costs, lack of facilitating conditions, or lack of ability to implement, especially Gen Z who show lower engagement in sustainable behaviors compared to other generations (Bergin-Seers & Mair, 2009; D'Acunto et al., 2025). In the context of WHC, this paradox may reflect the complexity of WHC behaviors that require sustained commitment, resource allocation, and skill development beyond the emotional attachment of tourists. This model suggests that positive attitudes toward WHS may be a necessary but not sufficient condition for conservation actions, especially when these behaviors involve personal costs for young tourists in the context of a low-middle-income developing country like Vietnam.

Fourth, the mediation analysis showed that awareness played a partial mediating role between reference groups and WHC behaviors (β = 0.185, t = 4.095, $p < 0.001$), while attitudes did not play a mediating role. This suggests that awareness plays a mediating role, strengthening the relationship between reference groups and WHC behaviors, and that social influences are both direct and indirect through providing conservation information and knowledge. This result provides evidence contrary to decades of emotion-focused conservation campaigns, but is consistent with the environmental behaviors model of (Wang et al., 2025), which emphasizes a knowledge base. The impact of cognition on WHC behaviors suggests that WHC behaviors operate more like professional or technical decisions that require factual knowledge than consumer choices driven by preferences and emotions (Tamar et al., 2021). In the context of WHC in developing countries in Southeast Asia, such as Vietnam, where conservation threats are often complex and invisible to casual observers, informed understanding may serve as a more reliable predictor of behavior than emotional attachment or attitudes.

Finally, the study used visitor knowledge as a moderator of the relationship between attitudes, awareness, and WHC behaviors. The moderator analysis results demonstrated that WHC knowledge strengthened the relationship between

awareness and behaviors ($\beta = 0.077$, $t = 2.122$, $p < 0.05$), but did not moderate the attitude-behavior relationship. This confirms that the relationship from awareness to behaviors is stronger when visitors' knowledge of WHC is involved. This result supports the study of (Liu et al., 2020) showing that WHC knowledge plays a significant role in shaping behavioral intentions and sometimes directly behaviors, but the path through attitudes is not always substantial. The moderator effects establish WHC knowledge as an important catalyst for converting WHC awareness into action (Tamar et al., 2021). This finding goes beyond the hierarchy of environmental knowledge of (Frick et al., 2004) By demonstrating that awareness alone is insufficient without an underlying understanding. This result points to WHC knowledge as an essential factor in converting awareness into behaviors. It suggests a "knowledge threshold": awareness can only be translated into action when visitors have a deep enough conservation understanding to interpret and act on conservation information. This boundary condition challenges one-size-fits-all conservation communication approaches and emphasizes the importance of segmenting audiences based on knowledge level rather than just demographic characteristics.

Theoretical Implications

This study makes several key theoretical contributions, as follows:

First, the differential effects of reference groups on conservation outcomes and their influence on WHC behaviors, both directly and indirectly through cognition, shed light on the "norm-information" mechanism in the context of WHC. While reference groups strongly predict attitudes and behaviors, their moderate influence on cognition suggests distinct psychological mechanisms. This pattern supports dual-process theories, indicating that social influence operates through both automatic (direct behavioral models) and controlled (cognitive) pathways.

Second, the study shows that awareness, not attitudes, is the predictor of behaviors, challenging a central assumption of the TPB. This finding contributes to the understanding of WHC behaviors in the context of sustainable tourism development by clarifying the role of cognitions versus attitudes as predictors of actual behaviors. In many previous research models, attitudes have often been considered central. However, the results of this study suggest that awareness may play a stronger role in some WHC cases, especially when reference groups and tourism experiences are influential.

Third, the paradox of WH tourism experiences directly influencing WHC behaviors, but not raising WHC awareness, challenges the assumptions of conscious tourism and educational tourism models in general. This finding contradicts the tourism industry's assumptions about automatic educational benefits from hands-on experience and the notion that "experience equals education".

Fourth, the insignificant attitude-behavior relationship contradicts traditional expectancy-value models but is consistent with recent findings from environmental psychology that document a gap between attitudes and behaviors. The strong cognition-behavior link supports models of information processing over affective frameworks, suggesting that cognitive understanding supersedes emotional appraisal in the context of WHC.

Fifth, the partial mediation of awareness in reference groups effects suggests that cognition sheds light on the psychological architecture underlying social influence in the context of sustainable heritage tourism development. Reference groups' effects transmitted through awareness rather than attitudes suggest that peer influence operates primarily through information sharing and collective meaning making rather than emotional contagion. This finding extends social cognitive theory by demonstrating that the influence of friends, family, and other social relationships influences complex WHC behaviors based on knowledge, rather than changing WHC attitudes of young tourists.

This is particularly relevant for complex WHC behaviors that require informed decision-making. This model implies that effective conservation communities operate more like learning networks than like-minded interest groups.

Finally, the finding of a moderating effect of knowledge between awareness and behaviors also extends theoretical models of environmental behaviors: knowledge is not just a predictor, but knowledge interacts with awareness to motivate behaviors. The moderating effect of knowledge on the cognition-behaviors relationship establishes knowledge as an important boundary condition, suggesting that awareness only translates into action when there is a strong foundation of knowledge. This interaction supports the knowledge-attitude-behavior hierarchy, providing evidence that WHC awareness translates into action mainly among individuals with sufficient professional knowledge.

Practical Implications

This study offers several practical implications for policymakers, heritage managers, and educators seeking to promote sustainable WHC behaviors among young tourists.

The findings confirm that reference groups exert strong effects on young tourists' conservation attitudes and behaviors. However, current WHC communication remains largely site-based and informational, limiting its reach. Policy-makers should adopt socially driven communication strategies, emphasizing peer influence through social networks, friendship groups, and youth communities. Partnerships with travel influencers and bloggers can amplify authentic conservation messages via platforms such as Instagram, YouTube, and Facebook. These figures can integrate personal stories and educational content to engage young audiences, particularly in developing countries where youth spend significant time online.

Tour guides serve as front-line educators who shape visitors' understanding of heritage value. Tourism authorities should develop WHC-oriented training and certification programs that combine interpretive, communicative, and behavioral-change skills. Well-trained guides can effectively translate conservation principles into compelling narratives and model responsible behavior during site visits.

The mixed effects of WH tourism experiences indicate the need to integrate emotional and educational components. Heritage management should develop immersive and authentic experiences, for example, interactive exhibits, hands-on

restoration workshops, craft activities, or digital storytelling, to strengthen place attachment and satisfaction. Establishing Heritage Knowledge Centers at site entrances, equipped with short documentaries, interactive quizzes, and VR/AR applications, can foster awareness of heritage value and fragility before tourists enter the site.

Awareness demonstrates a stronger direct effect on behaviors than attitudes. Hence, conservation initiatives should focus on awareness-raising programs, particularly peer-led campaigns that utilize social influence. Digital content should be concise, visual, and optimized for the social media platforms most used by Generation Z.

Since WHC knowledge moderates the relationship between attitudes, awareness, and behaviors, knowledge-building must be prioritized. Governments should develop a national heritage education framework linked to cultural and sustainable development strategies. Local authorities can organize community-based activities such as heritage festivals, student debates, or conservation days to engage youth. Schools and universities should integrate WHC into extracurricular programs and collaborate with WHS managers to organize low-cost educational tours with guided learning components.

Finally, interventions should move beyond belief-based campaigns toward behavior-oriented designs that integrate: (1) knowledge transfer; (2) activation of social norms through influencers, peers, and guides; and (3) supportive infrastructure, such as waste-sorting facilities, clear signage, and mobile applications for reporting or rewarding pro-conservation actions. Together, these measures shift WHC promotion from passive information dissemination to a socially endorsed, knowledge-rich, and infrastructure-enabled behavioral framework, thereby fostering long-term conservation engagement among young tourists.

Limitations and Future Research

Although this study has shown the relationship between the factors that motivate the WHC behaviors of young tourists to WHS, it has done so in the context of sustainable heritage tourism development in developing countries. However, this study still has some limitations. First, the average explanatory power for WHC awareness suggests that unmeasured factors significantly influence conservation knowledge. In the future, further studies could consider potential variables such as supporting infrastructure, cultural values, institutional factors, and media exposure.

Second, the results of measuring awareness and attitudes rely on self-report answers, which may be affected by social desirability bias. Third, the study sample focused on young tourists, so the results may not be entirely universal for older age groups or in different cultures. Further research directions could include extending the sample to different WHS sites and countries; incorporating qualitative methods (in-depth interviews) to explore the barriers between attitudes and behaviors; or testing knowledge and reference groups interventions to see how they might increase WHC behaviors. Alternatively, the lack of significance between attitudes and behaviors could reflect measured phenomena or unmeasured moderating factors such as behavioral control or normative pressures.

Future research should consider whether this model generalizes across different WHS and cultural contexts.

CONCLUSION

This study has contributed to clarifying the mechanisms influencing young tourists' WHC behaviors. The results indicate that the reference groups have a strong influence on attitudes, awareness, and behaviors. In contrast, WH tourism experiences directly impact attitudes and behaviors, but do not enhance awareness. Knowledge plays a crucial coordinating role, facilitating the conversion of conservation awareness into specific WHC actions.

Notably, the study confirms the existence of a gap between attitudes and behaviors and indicates that cognition, when reinforced by knowledge, is a more reliable predictor of behaviors. These findings contribute to theory by clarifying the dominant role of cognition, the existence of a knowledge threshold, and the experience paradox.

In practice, the study provides specific, feasible recommendations for local authorities, tourism businesses, and heritage management boards in designing effective interventions to promote sustainable conservation behaviors. These findings suggest multifaceted conservation interventions that leverage social networks, prioritize cognitive understanding, and address the knowledge prerequisites for WHC behavior change.

In summary, this study confirms that young tourists' WHC behaviors are driven by a combination of their knowledge and awareness of heritage values, their emotional connection to WHS, and the overall quality of their travel experience, all of which can be enhanced through educational strategies that enhance WHC knowledge and practical interpretation of conservation actions. This suggests a possible avenue for enhancing heritage management and conservation effectiveness in the context of sustainable tourism development.

Author Contributions: Conceptualization, V.T.Y and N.T.M.N.; methodology, V.T.Y and D.T.H.; software, V.T.Y validation, V.T.Y and D.T.H.; formal analysis, V.T.Y.; investigation, V.T.Y, D.T.H and N.T.T.N.; data curation, V.T.Y and D.T.H.; writing - original draft preparation, V.T.Y and N.T.T.N.; writing - review and editing, V.T.Y.; visualization, V.T.Y.; supervision, N.T.T.N; project administration, D.T.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research is funded by the Ministry of Education and Training of Vietnam, scientific research topic No. B2024-TMU-04, and by Thuongmai University, Hanoi, Vietnam.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study may be obtained on request from the corresponding author.

Acknowledgements: The research undertaken was made possible by the equal scientific involvement of all the authors concerned.

Conflicts of Interest: The authors declare no conflict of interest.

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Article history: Received: 16.09.2025 Revised: 06.02.2026 Accepted: 12.05.2026 Available online: 23.06.2026