

The impact of architectural heritage interpretation quality at the Imperial Citadel of Hue on responsible tourist behavior in sustainable tourism: the mediating role of personal norms

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Abstract

This study examines how the quality of sustainability-oriented architectural heritage interpretation at the Imperial Citadel of Hue is associated with responsible visiting behavior and whether personal norm partially mediates this relationship. A mixed-methods design was used. The qualitative phase refined the measurement items for the Hue heritage context, while the quantitative phase tested the measurement and structural models using survey data from 560 visitors collected between March and September 2025. Heritage interpretation quality was modeled as a second-order construct reflected by four first-order dimensions: content quality, attractiveness, delivery method, and integration of sustainable development messages. The measurement model showed acceptable reliability, convergent validity, and discriminant validity. Structural equation modeling indicated that heritage interpretation quality was positively associated with personal norm ($\beta = 0.603$; $p < 0.001$) and responsible visiting behavior ($\beta = 0.421$; $p < 0.001$), while personal norm was positively associated with responsible visiting behavior ($\beta = 0.223$; $p < 0.001$). The indirect effect of heritage interpretation quality on responsible visiting behavior through personal norm was significant ($\beta = 0.134$; $p = 0.010$), accounting for approximately 24% of the total effect. Among the first-order dimensions, delivery method and sustainability-message integration contributed most strongly to interpretation quality. Because the data are cross-sectional and self-reported, the findings should be interpreted as evidence of theoretically grounded associations rather than definitive causal proof. The study suggests that accessible delivery channels and conservation-oriented messages can strengthen visitors' moral responsibility and encourage more responsible behavior at architectural heritage sites.

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1. Introduction

The name of the central element of the Complex of Hue Monuments is the Imperial Citadel of Hue, which is a world heritage site under the UNESCO because of excellent value in the urban planning, architecture, landscape

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design, and court culture [1]. The citadel is more than an ensemble of separate buildings, it is a highly combined historical landscape whereby architectural space, ritual space, defensive design, and symbolic power are intertwined [2], [3], [4]. This combined nature contributes to the Hue an outstanding interpretive quality, although it also renders the location extremely vulnerable to the aggregate impacts of visitor pressure. Even seemingly trivial acts like touching or touching or handling ornamental surfaces, going beyond restricted circulation patterns, speaking loudly in serious places, littering, or taking the visit as a leisure experience will slowly lead to the destruction of both material preservation and quality of experience.

The visitor management has thus emerged to be a growing concern of the heritage destinations. Post-pandemic recovery and further development of tourism flows in Viet Nam, along with growing interest in cultural and experience-based travel, have created the necessity to adopt management strategies capable of both promoting visitation and preserving the heritage value [5], [6], [7]. The responsible visiting behavior is not peripheral at the sites like the Imperial Citadel of Hue. It is the core element of sustainable tourism since it is partly the choice of the visitors on what they wish to do during the tour that determines whether the authenticity, dignity and physical integrity are preserved [8]. Rules, monitoring and physical barriers are still needed, yet they are hardly effective alone. Soft management tools should also be used in heritage sites to construct what is understood, what is given attention and what is regulated.

One of the most applicable tools towards this end is heritage interpretation. The scholarship of classical and contemporary interpretations is always based on the fact that interpretation does not only convey factual information; it expresses meanings, introduces visitors to place, and determines the way the heritage will be interpreted and experienced [9], [10], [11]. Interpretation has also been associated with mindful visitation, quality richer experience and more appropriate behavior in tourism settings since it stimulates visitors to listen to the meaning instead of neutralizing the setting [12], [13], [14], [15]. In the case of architectural heritage in particular, interpretation can give visual and spatial elements a verbal form, understand why conservation regulations are important, as well as assist visitors in understanding how their own behavior impacts the conservation of a weak cultural landscape.

Nevertheless, the process of interpretation to responsible behavior is not always automatic. Individuals can get knowledge about a site and still not take responsible actions unless the information creates a sense of guilt. That is why, the idea of personal norm is of a theoretical importance. Personal norm can be described as a moral obligation that an individual possesses internally to do what is right or the right thing in a particular situation [16], [17], [18]. Personal norm has been demonstrated in numerous studies on tourism and pro-environmental behavior to justify voluntary and self-regulated behavior, particularly where the behavior cannot be attributed solely to external pressure or utilitarian calculus [19], [20]. Interpretation can trigger personal norm in a heritage setting by making the effects of irresponsible behavior visible and by defining conservation as a collective responsibility.

Research on Hue and other Vietnamese destinations has produced useful evidence on authenticity, destination image, experience quality, satisfaction, and electronic word-of-mouth [21], [22]. However, three gaps remain. First, interpretation quality in Vietnamese heritage settings has rarely been conceptualized as a multidimensional construct that combines cognitive, affective, communicative, and sustainability-oriented dimensions. Second, few studies explain the mechanism through which interpretation may move visitors from understanding a site to feeling morally obliged to protect it. Third, empirical evidence remains limited for architectural heritage sites where visitor behavior has direct implications for fragile spaces, ornamental surfaces, circulation routes, and ritual meanings.

To address these gaps, the current research examines the effect of sustainability-oriented heritage interpretation quality at the Imperial Citadel of Hue on responsible visiting behavior and tests personal norm as a mediating mechanism. The study differs from prior Vietnamese tourism studies by linking interpretation theory with norm-based behavioral theory and by modeling interpretation quality as a second-order construct comprising content quality, attractiveness, delivery method, and sustainability-message integration. The article then reviews the

relevant literature and formulates the hypotheses, outlines the research methodology, presents the empirical findings, discusses theoretical and managerial implications, and concludes with limitations and future research directions.

2. Literature review

2.1. Architectural heritage tourism and sustainable management at the Imperial Citadel of Hue

Heritage tourism is tourism generated by the desire, at least in part, of visiting places, objects, practices, and narratives that have historical and cultural significance [13]. In the example of the Imperial Citadel of Hue, this tourism experience cannot be isolated of the space logic of an architectural system that cannot be valued only on the monuments but also on the spatial, ritual, narrative, and historical memory [1], [2], [3], [4], [23]. This implies that the understanding of the visitors cannot be assumed. However, without proper interpretation, the visitors might be left with a visual, yet conceptually disjointed, impression. They can enjoy the beauty of the site but be unaware of why specific spaces are sensitive, why routes are set out in a certain manner, and why conservation-oriented behavior is important.

In heritage tourism, there has to be a tradeoff between visitor accessibility, community gain, quality of the experience, and long-term preservation [8], [24], [25]. The concept of sustainability does not therefore concern sustainability in ecological efficiency or visitor numbers at a complex site like Hue. It also comprises the communication of meaning and direction influence of visitor behavior. Interpretation is involved in the sustainability practice when it assists visitors to realize the importance and sensitivity of the heritage resource, fosters appreciation of place, and incorporates messages surrounding conservation into the experience rather than showing them separately as warnings. That is why the quality of interpretation is worthy of being discussed not only as the service attribute but as a variable of the strategic management.

2.2. Heritage interpretation quality as a second-order construct

The art and practice of revealing meaning has been termed as interpretation as opposed to just delivering information [9], [10]. The early approach of Tilden is that interpretation must connect what is being presented to what is in the personality or experience of the visitor, although Ham later extends the theme of interpretation being purposeful, relevant, enjoyable and organized [9], [10]. The modern approaches also emphasize the experiential and narrative aspect of interpretation stating that interpretive practice determines the way individuals imagine, feel, and ethically locate the self in connection with the past [11]. These views suggest that the quality of interpretation cannot be lower than the factual accuracy. A technically accurate but emotionally one-dimensional or poorly expressed message may not be able to steer behavior in the right direction.

The conceptualization of heritage interpretation quality in this study is based on the overall assessment of visitors on how well the interpretation system assists them in comprehending, engaging and responding suitably to the heritage environment. Based on this reasoning, it is conceptualized as a second-order measure of the collective impact of multiple complementary first-order measures and not a unitary characteristic. This method is suitable since interpretation in a heritage site is perceived as a system. Tourists are not just judging what is being told, but how clearly it is organized, how attractive it is, how easy it can be gained access to, and whether it conveys the reason to act responsibly.

The content quality is the first dimension. Content quality in an architectural heritage site is the degree of accuracy, clarity, coherence, and the adequacy of the information given to the visitors. Good content can assist the visitors to learn about the history, architectural nature, cultural meaning and preservation significance of the site [3], [4], [14], [26]. It minimizes the danger of superficial or distorted comprehension and gives the intellectual rationale of responsible action. Clear and reliable content provided to the visitors enables them to understand the rules and recommendations better as being meaningful instead of being arbitrary. The second dimension is attractiveness. When interpretation is interesting, evokes curiosity and maintains engagement, there is a higher chance that it will affect the visitors [10], [11], [12]. Telling of stories, graphic examples,

emotionally appealing words, illustration or an interpretive progression that invites visitors to experience a narrative progression instead of absorbing disconnected facts can all be used to achieve attractiveness. The issue of attractiveness is important in the context of heritage tourism as it facilitates conscientious interaction [12]. Attentive, emotionally engaged visitors are more likely to retain meanings, appreciate the place as being unique, and positively react to interpretive information. The third dimension is delivery method. Even good content may lose its power when the channels and forms of delivery are inconvenient, fragmented, or do not fit the needs of the visitors. Delivery method: This is the access, timing, and usability of the interpretive channels, including guided explanation, signage, printed resources, audio aid, digital resources or QR-based content. It also deals with the question of the distribution of interpretation throughout the visitor experience. Previous literature has proposed that the quality of experience and the environmental oriented behavior are influenced by both the contents of the message and how the visitors receive and perceive the message in the course of the visit [14], [15]. In one of the sites such as Hue, where the visitors differ in terms of their language background, time budget as well as information preferences, the delivery method will probably be particularly significant.

Sustainability development message integration is the fourth dimension. Sustainable interpretation does not separate conservation messages out of the heritage narrative; rather, it incorporates them into the explanation of why the site is important and how visitor behavior will help maintain the site [8], [11]. This dimension describes the extent to which interpretation can be used to understand what is vulnerable to heritage resources, why the visitation should be done respectfully, and how the visitors should be motivated to feel as part of the preservation process as opposed to being mere consumers. This type of integration is particularly beneficial in architectural heritage since harmful behaviors are usually normalized unless their effects are brought into the limelight and become morally significant. Collectively, these four dimensions indicate that effective heritage interpretation is both informational and performative. It educates visitors about the past, but it also coordinates attention, creates meaning, and structures behavior in the present. In the context of the Imperial Citadel of Hue, visitors experience interpretation through a sequence of signs, guided explanations, route markers, brochures, and digital or QR-based prompts rather than through a single isolated message. Therefore, a second-order approach provides a more suitable conceptualization of interpretation quality than any single attribute. It allows the study to examine the contribution of the whole interpretation system to moral and behavioral outcomes while still identifying the relative contribution of each first-order dimension.

2.3. Personal norm and responsible visiting behavior

Responsible visiting behavior is a collection of behaviors whereby visitors reduce the adverse effects and add value to the heritage environment. Some of the behaviors in the case of the Imperial Citadel of Hue are adherence to prescribed paths, compliance with site rules, not touching vulnerable surfaces and objects, maintaining cleanliness of the surrounding, minimizing disruption to others, and promotion of conservation values. This knowledge is aligned to the wider body of literature of prosocial and environmentally meaningful conduct in tourism, which focuses on self-restraint, respect to place, and voluntary collaboration in sustaining the quality of common resources [17], [20]. Personal norm is different conceptually as compared to mere preference or liking attitude. It refers to a personal feeling of moral duty that makes people do what is right even when no one is looking at them [16], [17], [18]. In norm activation model, personal norm is reinforced when people start to notice the outcomes of behavior and also embrace some level of responsibility of the outcomes [16], [18]. This renders personal norm very pertinent to heritage visitation in which most of the relevant behaviors are self-imposed and not enforced constantly. A visitor can be aware of the existence of the rules, but responsible behavior is more probable when the visitor is also convinced that doing the right thing is to adhere to the rules.

2.4. Hypothesis development

2.4.1. Heritage interpretation quality and personal norm

The initial hypothesis is based on the connection between the quality of heritage interpretation and individual norm. Personal norm is likely to be impacted by interpretation as it may render the relevance and vulnerability

of heritage resources cognitively perceivable and morally relevant. When they explain to the visitors the reasons behind the importance of a site in an accurate, coherent, and engaging manner, they tend to make them feel that there are repercussions to careless behavior beyond their personal experience. Interpretation can also make visitors temporary custodians of a common cultural resource instead of being disinterested observers. This framing is in line with the logic of norm activation whereby awareness of consequences and assigning responsibility are antecedents of personal norm [16], [18].

Moreover, messages based on sustainability can directly relate the appreciation of the heritage with responsibility. In case interpretation clarifies that respectful circulation, noise control, cleanliness, and non-contact behavior are to be practiced in order to maintain the site to the future generation, visitors can internalize the expectations as moral responsibilities, not as rules. According to previous studies on tourism, meaningful interpretation and value-based communication has the capacity to foster environmentally and socially desirable behavior, by exerting influence on internal standards of behavior [15], [19], [20]. Hence, the improved quality of heritage interpretation is likely to enhance personal norm.

H1: Heritage interpretation quality has a positive effect on personal norm.

2.4.2. Personal norm and responsible visiting behavior

The second hypothesis is concerned with the correlation between personal norm and responsible visiting behavior. According to the moral and prosocial action, personal norm is a self-regulatory force that assists in behavior even when external incentives are scanty [16], [17], [18]. Within heritage contexts, a large number of forms of responsible behavior are low-visibility behaviors. Tourists decide whether they will remain within designated areas, avoid physical contact, whisper in sacred areas, or keep litter at the right place. These actions might not be accompanied by instant individual payoffs, but they have higher chances of taking place when the visitors are morally required to behave in a certain way. This proposal is consistent with existing tourism studies which reveal that variables defined by norms may be used to explain pro-environmental intention and prosocial behavior in tourism contexts [19], [20]. The personal norm is especially relevant in the situation when the maintenance of shared resources relies on the number of minute acts of adherence and restraint. The responsible visiting behavior can be perceived as a reaction to rules and as a demonstration of internalized respect to heritage in the Imperial Citadel of Hue as well. In line with this, greater personal norm will enhance responsible visiting.

H2: Personal norm has a positive effect on responsible visiting behavior.

2.4.3. Heritage interpretation quality and responsible visiting behavior

The third hypothesis is used regarding the direct correlation between the quality of heritage interpretation and the responsible visiting behavior. Interpretation can influence behavior without necessarily going completely through personal norm since it can offer situational direction. Clarity of signs, rational elaborations, convenient channels of delivery, and appealing interpretive indicators can diminish the confusion of what and why should be done by the visitors. Through this, interpretation has the practical role of orienting by making the desirable behavior more visible, easier to track and more agreeable to the general experience. Additionally, quality interpretation may have an impact on behavior by making people pay attention and get involved. The tourists attracted into the connotations of a place will be less likely to act recklessly since the place is no longer viewed as an unspecific background. Studies of mindful visitation, experience quality, and environmentally oriented tourist behavior indicate that interpretation and experience design can have a direct effect on visitor experience of the place [12], [14], [15], [27]. At the Imperial Citadel of Hue, it means that the responsible visiting behavior should be encouraged directly by better interpretation as well as indirectly by personal norm.

H3: Heritage interpretation quality has a positive effect on responsible visiting behavior.

Taken together, the literature suggests an integrated theoretical logic. Interpretation quality improves the cognitive accessibility and emotional salience of heritage meanings; these meanings can activate personal norm by making conservation a matter of individual responsibility; and personal norm can then support responsible

visiting behavior that is voluntary, self-regulated, and difficult to enforce through rules alone. This logic connects interpretation theory with norm-based behavioral theory and provides the basis for the proposed mediation model.

2.5. Research model

Based on the above arguments, the proposed research model positions heritage interpretation quality as a second-order construct that directly affects responsible visiting behavior and indirectly affects it through personal norm. The logical sequence of the model is that high-quality interpretation first makes the value and vulnerability of the heritage site more understandable; this understanding can strengthen visitors' sense of moral obligation; and this internal obligation can then encourage self-regulated responsible behavior during the visit. At the same time, interpretation may also guide behavior directly by making expected actions clearer and easier to perform.

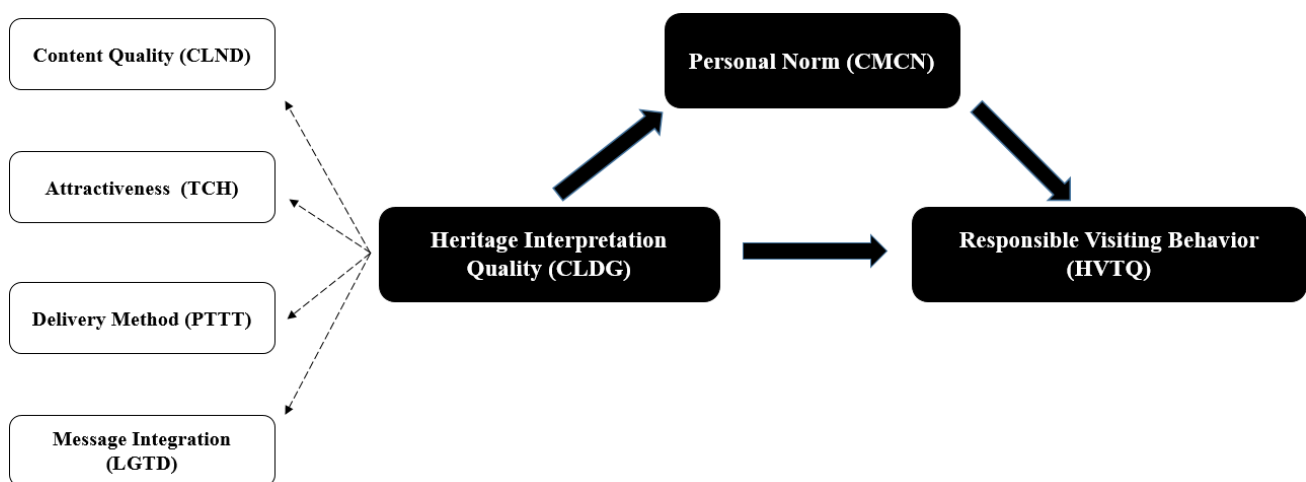


Figure 1. Proposed research model

3. Research methodology

3.1. Research design and study context

This study employed a mixed-methods design comprising a qualitative phase for scale refinement and a quantitative phase for hypothesis testing. The design was chosen because the focal constructs needed to be adapted to the specific architectural heritage context of Hue. Although interpretation, norm-based behavior, and sustainable tourism have strong conceptual foundations [8], [9], [20], survey items must be understandable to visitors who evaluate interpretation during an actual site visit. Therefore, the qualitative phase improved semantic clarity and contextual relevance before the quantitative model was tested through CFA and SEM.

This design fits the research context very well. The Imperial Citadel of Hue is a blend of monumental architectural culture, heavy tourist traffic and management imperative of balancing access with conservation. On-site interpretation is not a mere educational supplement, but it belongs to the operational system by which visitors learn routes, meanings, restrictions and preservation sensitive behavior. This rendered the citadel a suitable place to investigate whether quality of interpretation can directly and indirectly influence responsible behavior using personal norm.

3.2. Qualitative phase and scale refinement

The qualitative stage employed semi-structured interviews with 35 participants selected purposively. The selection criteria were that participants had to be at least 18 years old, have previous experience of heritage visits, and be able to comment on interpretive materials and visitor behavior. Priority was given to participants who had visited or were visiting the Imperial Citadel of Hue so that their comments would be grounded in the study context. The interview guide covered four topics: the clarity of draft scale items, memorable aspects of interpretation, perceptions of sustainability messages, and behaviors considered appropriate or inappropriate at

the site. This phase was used to confirm that respondents could distinguish interpretation quality, moral obligation, and actual behavior. A thematic approach was used to summarize the qualitative data. Comments were grouped into recurrent issues such as language clarity, item redundancy, ease of comprehension, and practicality of interpretive channels. As a result, several items were paraphrased in more visitor-friendly language, and items that expressed more than one idea were revised or removed. The dimension concerning integration of sustainable development messages was narrowed to items that captured conservation importance, low-impact visitation, and preservation responsibility rather than general approval of sustainability.

3.3. Quantitative phase, sampling, and data collection

The quantitative phase used a structured questionnaire with five-point Likert-scale items ranging from 1 (strongly disagree) to 5 (strongly agree). A five-point scale was selected because it is familiar to Vietnamese respondents, reduces response burden in an on-site intercept survey, and still provides adequate variation for CFA and SEM. Data were collected at the Imperial Citadel of Hue between March and September 2025. Visitors were approached near the end of their visit at exit areas, rest points, and interpretive display zones so that they had sufficient experience to evaluate the interpretation system. A preliminary survey with 65 observations was conducted to identify ambiguous wording and improve the flow of the questionnaire.

The final dataset consisted of 560 valid responses. Respondents were screened to ensure that they were at least 18 years old, had completed most or all of their visit, and had been exposed to at least one interpretive channel such as signage, guided explanation, printed information, audio support, or QR/digital content. The sample contained visitors with different demographic and residential backgrounds, which increased variation in perceptions and behavior. Although the study does not claim statistical representativeness of all visitors to Hue, the sample size is adequate for testing first-order constructs, the higher-order interpretation-quality construct, and the proposed structural relationships.

3.4. Measurement structure and data analysis strategy

There are three conceptual blocks in the measurement model. The first is heritage interpretation quality (CLDG), a second-order construct reflected by four first-order dimensions: content quality (CLND), attractiveness (TCH), delivery method (PTTT), and integration of sustainable development messages (LGTD). The second is personal norm (CMCN), which captures the respondent's internal sense of moral obligation to behave properly at the heritage site. The third is responsible visiting behavior (HVTQ), which captures self-reported responsible conduct during or around the visit. The scale structure and retained items are summarized in Table 1.

Internal consistency was assessed through Cronbach's Alpha and composite reliability. Convergent validity was examined using standardized loadings and average variance extracted, while discriminant validity was assessed through confirmatory factor analysis of the full measurement structure. The higher-order construct was estimated by allowing the four first-order dimensions to load on heritage interpretation quality. SEM was then used to test the direct hypotheses and the mediating role of personal norm. The indirect effect was tested by bootstrapping with 5,000 resamples. Common method bias and social desirability bias were considered procedurally by using anonymous responses, neutral wording, separated construct blocks, and an instruction that there were no right or wrong answers. Because the behavior measure remains self-reported, this issue is also acknowledged as a limitation.

Table 1. Structure of the scales used in the research model

Construct	Code	Role	Retained items	Adapted from
Content quality	CLND	First-order dimension of CLDG	CLND1, CLND2, CLND4	[9], [14], [21], [22]
Attractiveness	TCH	First-order dimension of CLDG	TCH1, TCH3, TCH4	[9], [14], [21], [22]
Delivery method	PTTT	First-order dimension of CLDG	PTTT1–PTTT4	[9], [12], [21], [22], [15]

Construct	Code	Role	Retained items	Adapted from
Integration of sustainable development messages	LGTD	First-order dimension of CLDG	LGTD1–LGTD4	[8], [15], [19]
Personal norm	CMCN	Mediating variable	CMCN1–CMCN4	[16], [19]
Responsible visiting behavior	HVTQ	Dependent variable	HVTQ1–HVTQ6	[12], [14], [15], [19], [20]

4. Results

4.1. Sample characteristics

Table 2 shows the profile of the respondents. The sample is quite heterogeneous regarding gender, age, and education, as well as, the residence. The proportion of female respondents (57.3) and male respondents (41.6) in the sample is equal. The working ages of 26-35 years and 36-45 years make up majority of the respondents, meaning that the sample is not focused on the student and the elderly segments. The educational profile also has a good outlook towards interpretive evaluation in the sense that a high percentage of the respondents possess college or university education.

One of the key descriptive characteristics is the fact that 87.9% of the respondents state that they had never been to the Imperial Citadel of Hue. This indicates that the sample is mostly dominated by first-time visitors. The model thus in substantive terms reflects the influence of interpretation on visitors who draw heavily on the information that they receive during the present visit. It is important to remember this aspect in terms of the generalizability of the findings, as the repeat visitors might interpret the interpretation differently.

Table 2. Sample characteristics

Category	Group	Frequency	Percentage (%)
Gender	Male	233	41.6
	Female	321	57.3
	Other	6	1.1
Age	18–25	48	8.6
	26–35	194	34.6
	36–45	174	31.1
	Over 45	144	25.7
	Other	14	2.5
Highest educational attainment	High school	42	7.5
	Vocational college/College	178	31.8
	University	226	40.4
	Postgraduate	93	16.6
	Other	21	3.8
Current residence	Thua Thien Hue	250	44.6
	Other provinces/cities (Vietnam)	229	40.9
	Abroad	81	14.5
Previously visited the Imperial Citadel of Hue	Never	492	87.9
	Yes	68	12.1

4.2. Measurement model assessment

The reliability data presented in Table 3 show that internal consistency is satisfactory in the retained scales. The Cronbach's alpha values for the first-order constructs range from 0.789 to 0.869, which is higher than the generally accepted threshold for both exploratory and applied research. The values of composite reliability are also satisfactory, and average variance extracted values are higher or close to the traditional standard, which

confirms convergent validity. The construct scores are clustering around the midpoint-to-positive range which indicates that the respondents rated the interpretation system and their own norm-related and behavior-related statements in a relatively favorable way and not at the extreme levels. It is additionally confirmed that the data structure is adequate as the exploratory factor analysis supports this. The Kaiser-Meyer-Olkin value is 0.912, and Bartlett test is significant as indicated in Table 4, indicating that the correlation matrix is suitable in extracting the factors. Six factors are obtained and the cumulative variance explained is 54.029 which is good enough as a model with several psychological and experience constructs being measured in field. These findings indicate that the items that are retained are significant clusters around the intended latent variables.

The overall measurement model was then subjected to confirmatory factor analysis. The fit indices demonstrated in Figure 2 and Table 4 reveal a very good fit of the model: chi-square/df = 1.300, GFI = 0.955, AGFI = 0.945, CFI = 0.986, TLI = 0.984, RMSEA = 0.023, and PCLOSE = 1.000. A combination of these indices suggests that the data measured is well-fitted to the suggested measurement structure. The loadings presented in the CFA diagram are also always significant, which supports the trust in the retained items and proves the distinction between the first-order dimensions, personal norm, and responsible visiting behavior.

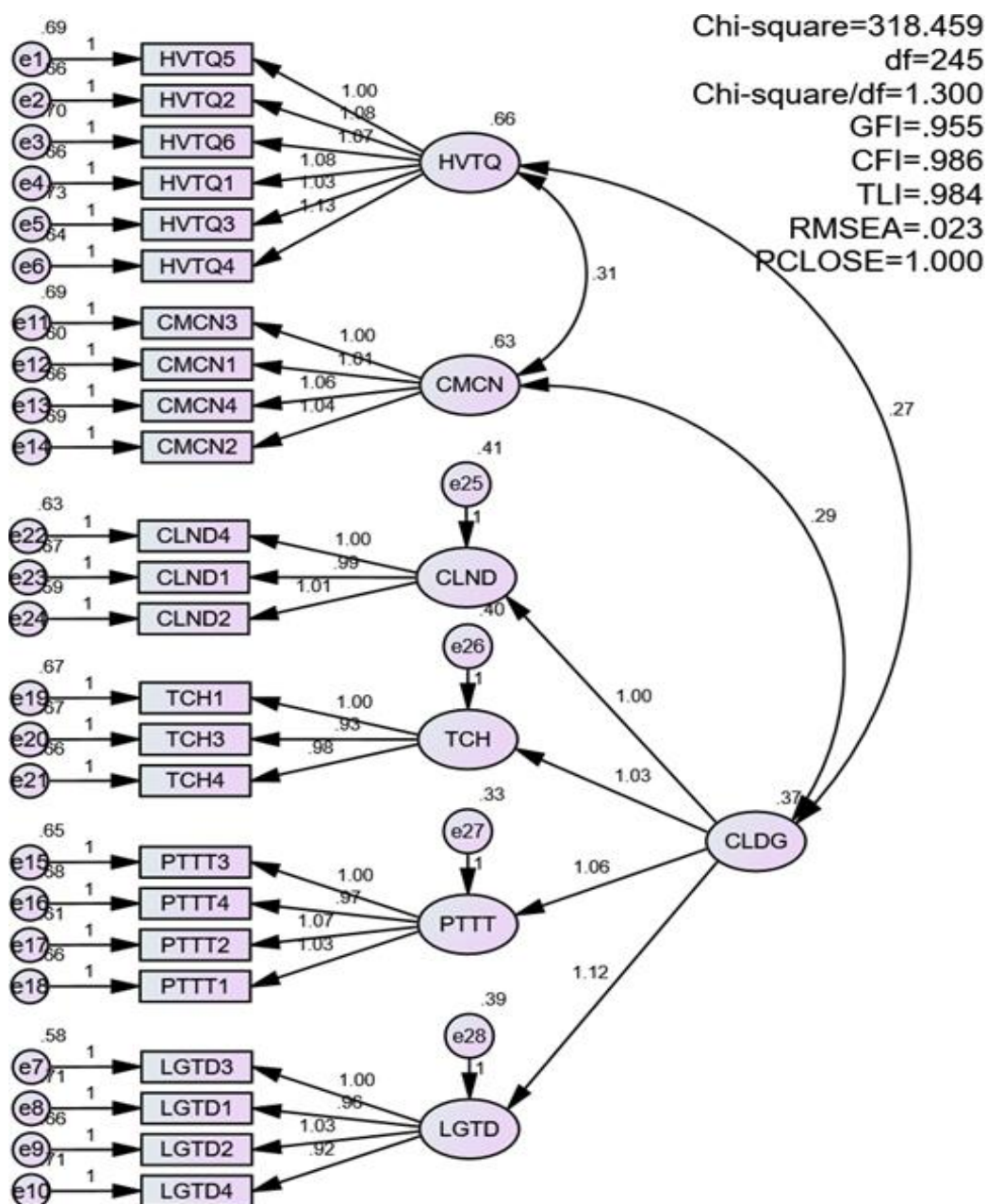


Figure 2. Overall CFA results

Table 3. Descriptive statistics at the construct level and scale reliability

Construct	Mean	Cronbach's Alpha	Composite reliability	Average variance extracted
CLDG	3.520	—	0.809	0.515
CLND	3.497	0.815	0.786	0.550
TCH	3.527	0.789	0.769	0.526
PTTT	3.525	0.825	0.825	0.541
LGTD	3.532	0.829	0.829	0.549
CMCN	3.522	0.803	0.802	0.504
HVTQ	3.490	0.869	0.869	0.526

Table 4. EFA results and fit indices of the overall measurement model

Content group	Indicator	Value
EFA conditions	Kaiser–Meyer–Olkin	0.912
	Bartlett's chi-square	5469.526
	Degrees of freedom	276
	Significance level	0.000
Extraction results	Number of extracted factors	6
	Total variance explained	54.029%
CFA model fit	Chi-square	318.459
	df	245
	Chi-square/df	1.300
	GFI	0.955
	AGFI	0.945
	CFI	0.986
	TLI	0.984
	RMSEA	0.023
PCLOSE	1.000	

Table 5. Contribution of first-order dimensions to heritage interpretation quality

First-order dimension	Standardized coefficient	Significance level	Approximate explained variance
CLND	0.687	< 0.001	47.2%
TCH	0.705	< 0.001	49.7%
PTTT	0.745	< 0.001	55.5%
LGTD	0.732	< 0.001	53.6%

Table 5 estimates the contribution of the four first-order dimensions to the second-order construct of heritage interpretation quality. The standardized coefficient of delivery method is the highest (0.745), followed by integration of sustainable development messages (0.732), attractiveness (0.705), and content quality (0.687). This pattern is theoretically meaningful because it suggests that visitors judge interpretation not only by whether information is correct but also by whether it is available, usable, timely, and behaviorally relevant during the actual visit. At the Imperial Citadel of Hue, the practical experience of receiving interpretation appears to be as important as the content itself.

4.3. Structural model and mediation results

After the measurement model was validated, the hypotheses were tested through structural equation modeling. The path coefficients in Figure 3 and Table 6 indicate that all three hypotheses are supported. H1 is supported because heritage interpretation quality positively affects personal norm ($\beta = 0.603$; $p < 0.001$). H2 is supported because personal norm positively affects responsible visiting behavior ($\beta = 0.223$; $p < 0.001$). H3 is supported

because heritage interpretation quality also has a direct positive effect on responsible visiting behavior ($\beta = 0.421$; $p < 0.001$).

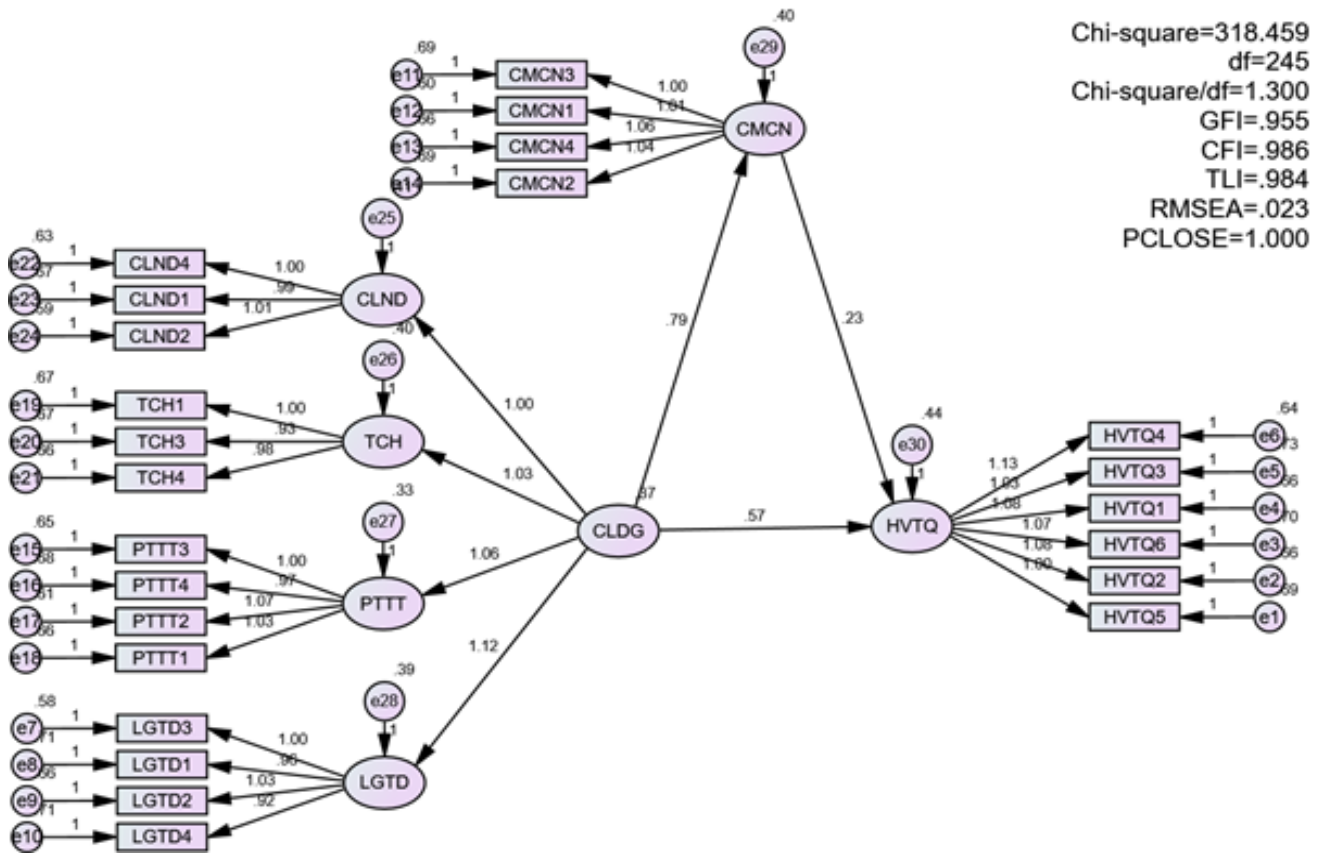


Figure 3. Structural equation modeling results

Table 6. Hypothesis testing results, effects, and explanatory power of the model

Category	Relationship/Indicator	Value	Conclusion
Hypothesis	H1: CLDG → CMCN	$\beta = 0.603$; $p < 0.001$	Accepted
	H2: CMCN → HVTQ	$\beta = 0.223$; $p < 0.001$	Accepted
	H3: CLDG → HVTQ	$\beta = 0.421$; $p < 0.001$	Accepted
Effects	Indirect CLDG → HVTQ via CMCN	0.134; $p = 0.010$	Significant
	Total CLDG → HVTQ	0.555	—
	Share of indirect effect	24%	—
R ²	CMCN	0.364	Moderate
	HVTQ	0.340	Moderate

The mediation analysis provides further information about the behavioral mechanism. The indirect effect of heritage interpretation quality on responsible visiting behavior through personal norm is 0.134 and is statistically significant ($p = 0.010$). The total effect is 0.555, and the indirect effect accounts for approximately 24% of the total effect. This indicates partial mediation rather than full mediation. In other words, interpretation quality influences responsible behavior both directly, by orienting visitors toward appropriate actions, and indirectly, by strengthening visitors’ internal sense of moral commitment. The model explains 36.4% of the variance in personal norm and 34.0% of the variance in responsible visiting behavior, which is acceptable for a field-based visitor behavior study.

5. Discussion and implications

5.1. Discussion of the main findings

The first important finding is that heritage interpretation quality can plausibly be treated as a second-order construct. This is important because visitors experience interpretation as a system rather than as isolated service attributes. Content quality remains necessary, but it is not sufficient by itself. Interpretation quality also depends

on whether the message is engaging, whether it is delivered through convenient and understandable channels, and whether it integrates sustainability in a way that explains why responsible behavior matters. This finding is consistent with interpretation theory, which emphasizes relevance, organization, accessibility, and emotional resonance as key conditions of interpretive effectiveness. The second important finding is that interpretation quality is positively related to personal norm. This supports the argument that interpretation does more than improve knowledge. By explaining the meaning and vulnerability of heritage, interpretation can invite visitors to see themselves as temporary custodians of a shared cultural resource. In a historically charged site such as the Imperial Citadel of Hue, appropriate behavior often depends on self-control and respect rather than constant external enforcement. Interpretation therefore functions as a norm-activation device as well as an instructional device. The third finding is that personal norm has a positive effect on responsible visiting behavior. This is consistent with the norm activation model and with broader tourism research on pro-environmental and prosocial conduct. Many responsible actions at heritage sites are low-visibility behaviors, such as staying within designated routes, avoiding physical contact with surfaces, reducing noise, and keeping the area clean. These behaviors are more likely to occur when visitors feel that acting responsibly is personally and morally right, even when direct monitoring is absent. The fourth finding concerns mediation. Personal norm partially mediates the effect of interpretation quality on responsible visiting behavior. This means that interpretation operates through two complementary pathways. One pathway is direct: interpretation makes expected behavior clearer, more understandable, and easier to follow. The other pathway is indirect: interpretation strengthens internal moral commitment, which supports self-regulated behavior. Heritage managers should therefore not view interpretation merely as either information delivery or moral appeal; effective interpretation combines both functions.

The trend of first-order loadings also deserves attention. Delivery method makes the strongest contribution to the higher-order construct, followed by integration of sustainable development messages. The prominence of delivery method may reflect the practical conditions of a large heritage complex, where visitors move through many spaces, receive information at different moments, and differ in language background and time budget. Sustainability-message integration is also strong because visitors may not automatically connect ordinary behaviors with heritage preservation. When messages explain why route compliance, noise control, non-contact behavior, and proper waste disposal matter for conservation, responsible conduct becomes part of the meaning of the visit rather than a separate set of prohibitions.

5.2. Theoretical implications

The research has several theoretical contributions. First, it advances heritage interpretation research by operationalizing interpretation quality as a second-order construct that combines cognitive, affective, communicative, and sustainability-focused dimensions. Second, it introduces personal norm as a mediating mechanism that explains why interpretation quality matters for behavior. This connection integrates interpretation scholarship with norm-based behavioral theory and shows that visitor management can be examined from a moral-cognitive perspective. Third, the study provides evidence from an architectural heritage site in Viet Nam, thereby extending research that has more often focused on destination image, satisfaction, authenticity, or overall experience quality. These are small but significant contributions. The findings do not mean that interpretation is the only factor that influences visitor behavior. On the contrary, they demonstrate that interpretation is only a valuable aspect of a more comprehensive behavioral system. In environments where behavior is determined by social norms, crowding, path structure, personnel presence, and visitor motives, even showing a consistent and significant role of interpretation quality is in itself noteworthy. The paper thus endorses a more holistic perspective of heritage management where communication, morality and visitor behavior would be perceived as interdependent.

5.3. Managerial and policy implications

For managers of the Imperial Citadel of Hue, the results suggest that improvement should begin with delivery design. Interpretation should be available when and where visitors need it, in forms that suit different visitor

groups. Concrete improvements may include multilingual signs at key decision points, short QR-based stories linked to specific architectural spaces, audio or mobile explanations for independent visitors, and clearer route cues in areas where visitors are likely to enter sensitive zones. Guided interpretation should also be sequenced so that conservation expectations are explained before visitors reach fragile spaces rather than after inappropriate behavior has already occurred.

The second managerial priority is to integrate sustainable development and conservation messages into the heritage narrative. Preservation-based guidance should not appear as impersonal prohibition only. Instead, messages can explain why specific behaviors matter: visitors should avoid touching carved or painted surfaces because repeated contact accelerates deterioration; remain on marked routes because some spaces are structurally or ritually sensitive; reduce noise in solemn spaces because sound affects the interpretive atmosphere; and dispose of waste properly because cleanliness is part of respect for the heritage landscape. Such framing is more likely to activate personal norm because it connects visitor action with heritage meaning and future public benefit.

Attractiveness should also be understood as more than a superficial service feature. Story-based, visually coherent, and emotionally resonant interpretation can help visitors remember the importance of the site and the behaviors expected of them. At an architectural heritage destination, this may involve narrative points that connect spatial features with court life, ritual meanings, restoration history, or conservation stories. When visitors are drawn into a meaningful story, they are less likely to treat the heritage space casually.

Content quality remains a managerial prerequisite. Interpretive content should be accurate, concise, internally consistent across channels, and directly related to the spaces through which visitors pass. Guided tours, signs, brochures, and digital content should use compatible terminology so that visitors do not receive conflicting explanations. Content should not only describe what an object or space is, but also explain why it matters and how visitors should behave in relation to it. The results on personal norm suggest that interpretation should intentionally encourage ethical reflection rather than merely transfer knowledge. Managers can use language that emphasizes stewardship, continuity, and collective responsibility for future generations. This should be done without a moralizing tone. The goal is to help visitors visualize the cumulative impact of small actions and to see themselves as part of the preservation process.

Finally, the study supports a behavior-oriented approach to interpretation planning. Managers should not evaluate interpretation only through visitor satisfaction or enjoyment. They can also assess whether interpretation makes desired behavior clear, reduces ambiguity, and supports self-regulation. Future indicators may therefore include perceived responsibility, clarity of behavioral guidance, and observed compliance in sensitive areas, alongside conventional indicators of understanding and enjoyment.

5.4. Limitations and future research

This research has several limitations. First, the data are cross-sectional, which limits causal inference. Although the proposed relationships are theoretically grounded and statistically significant, longitudinal or experimental studies would provide stronger evidence of how interpretive exposure changes norms and behavior over time. Second, the study relies on self-reported responsible behavior. As in other survey-based studies, social desirability bias may lead some respondents to overstate how responsibly they behaved during the visit. Procedural remedies were used, but this limitation cannot be fully removed without observational or experimental data.

Third, the study is limited to a single architectural heritage destination. The Imperial Citadel of Hue is significant and distinctive, but its interpretation environment, visitor dynamics, and management practices may differ from museums, archaeological parks, spiritual heritage sites, or living heritage communities. Fourth, the sample is dominated by first-time visitors. This is useful for examining the immediate role of on-site interpretation, but repeat visitors may rely more on prior knowledge, memory, or place attachment. Comparative studies across

site types and visitor segments would help determine whether the same dimensions of interpretation quality are equally important elsewhere.

Future research can extend the model in several ways. Researchers may compare first-time and repeat visitors, test moderating effects of domestic and international visitation, or include additional constructs such as place attachment, heritage value perception, crowding, and perceived behavioral control. Mixed-methods or experimental studies could also examine how specific messages are interpreted in the field and how staff-mediated interpretation interacts with digital tools. Such work would deepen understanding of when and how interpretation becomes an effective tool for sustainable behavioral management.

6. Conclusion

This study investigated how sustainability-oriented architectural heritage interpretation quality at the Imperial Citadel of Hue is associated with responsible visiting behavior and whether personal norm partially mediates this relationship. Using a mixed-methods design and survey responses from 560 visitors, the study found that heritage interpretation quality can be modeled as a second-order multidimensional construct reflected by content quality, attractiveness, delivery method, and integration of sustainable development messages. All three hypothesized relationships were statistically supported, and the mediation analysis showed that personal norm partially transmits the effect of interpretation quality on responsible behavior. The results indicate that interpretation can support sustainable heritage tourism through two mutually reinforcing functions. Directly, it clarifies behavioral expectations and makes responsible actions easier to understand. Indirectly, it strengthens moral commitment and self-regulated behavior through personal norm. The delivery method and sustainability-message integration are among the strongest dimensions of interpretation quality, suggesting that managerial attention should focus on both the accessibility of interpretive channels and the conservation framing of messages.

Finally, the paper concludes that interpretation at architectural heritage sites should be understood as a behavioral management tool as well as an informational service. At the Imperial Citadel of Hue, better interpretation can help transform appreciation into responsibility. This conclusion is relevant not only to Hue but also to other heritage destinations that must balance visitor experience with long-term conservation. Because the study is cross-sectional and based on self-reported data, the findings should be interpreted as evidence of theoretically grounded associations rather than definitive causal proof.

Declaration of competing interest

The authors declare that there are no known financial or non-financial competing interests related to this study.

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Author contribution

The authors contributed to the study conception and design, data collection, analysis and interpretation of results, draft preparation, and final revision of the manuscript.

Ethical approval statement

Ethical approval is not applicable for this research.

Informed consent

Informed consent was obtained from all participants before they completed the questionnaire.

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