

Visitor Heterogeneity in Archaeological Heritage Tourism: A Latent Profile Analysis of Experience Patterns at Sanxingdui

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Abstract

Visitors to archaeological heritage attractions are not homogeneous, yet much of the existing literature estimates average relationships among perceived value, satisfaction, and behavioral intention. Such variable-centered analyses may conceal meaningful differences in how visitors experience the same site. Using Sanxingdui as the case, this study applies latent profile analysis to 371 valid questionnaires and identifies visitor subgroups from three dimensions of experience value: functional, emotional, and social value. The profiles are then compared in terms of visit motivations, satisfaction, behavioral intention, and demographic characteristics. Model comparison supports a four-profile solution that balances statistical fit, classification quality, parsimony, and substantive interpretability. The sample comprises a low-experience-perception profile (17.8%), a moderate-experience-perception profile (41.2%), an elevated-experience-perception profile (26.7%), and a high-experience-identification profile (14.3%). Heterogeneity is expressed primarily as a graded structure in which all three value dimensions rise together, rather than as sharply separated functional, emotional, or social preference types. Satisfaction and behavioral intention increase markedly in the elevated and high-identification profiles, whereas differences between the low and moderate profiles are not statistically significant after adjustment, suggesting a threshold-like group pattern. All four visit motivations become stronger across the higher profiles, while basic demographic variables do not reliably distinguish class membership. The study extends archaeological tourism research from average net effects to person-centered heterogeneity and recommends prioritizing the large moderate profile through integrated interpretation, emotional storytelling, and socially shareable experiences.

Keywords

archaeological heritage tourism, visitor heterogeneity, experience patterns, latent profile analysis, Sanxingdui

1. Introduction

Archaeological heritage tourism translates professional archaeological knowledge into publicly accessible cultural experiences through sites, artifacts, interpretation, exhibition design, and visitor participation. Unlike conventional sightseeing, it can simultaneously involve learning, aesthetic appreciation, emotional arousal, identity construction, and social interaction. Recent heritage tourism scholarship has therefore emphasized

authenticity, immersion, digital engagement, and experience quality [1,2,3,4]. At a highly recognizable site such as Sanxingdui, whose artifacts combine strong visual symbolism with unresolved historical narratives and considerable public attention, these forms of value are likely to operate together.

Most quantitative studies, however, treat a visitor sample as broadly homogeneous and estimate average effects through regression or structural equation modeling. Perceived value has been shown to enhance satisfaction and loyalty among heritage tourists [5,6], while authenticity, interactivity, and memorable experience are associated with satisfaction, recommendation, and revisit intentions [7,8,9,10]. These findings clarify general relationships among constructs, but they do not answer a different question: Do visitors perceive archaeological tourism value in different combinations or at different levels, and which groups are most likely to move from an ordinary visit to strong satisfaction and advocacy?

Visitor classification is a long-standing issue in cultural tourism research. Earlier typologies commonly relied on cultural motivation and depth of involvement [11,12], whereas recent studies have used latent class and latent profile techniques to identify heterogeneity among cultural tourists, museum visitors, and heritage-site visitors [13,14,15,16]. A person-centered approach shifts attention from asking which single variable is most important to examining which configurations of variables coexist within particular groups of people.

This study reanalyzes a 371-response Sanxingdui visitor dataset that was previously used for a variable-centered investigation. The earlier study examined the pathways through which functional, emotional, and social value influenced behavioral intention via satisfaction [17]. The present study does not repeat those mediation tests. Instead, it asks whether meaningful experience profiles exist beneath the average relationships. Latent profile analysis is used to identify visitor groups, compare their motivations, satisfaction, and behavioral intention, and test whether basic demographic characteristics explain profile membership. The objective is to provide a more differentiated but methodologically accessible basis for managing Sanxingdui and comparable archaeological heritage attractions.

2. Literature Review and Research Questions

2.1 Multidimensional Experience Value in Archaeological Heritage Tourism

Perceived value is generally understood as an overall judgment formed by weighing what a visitor receives against what is given up. Sweeney and Soutar [18] distinguished functional, emotional, and social dimensions of consumer value, and this framework has subsequently informed tourism experience research. Functional value concerns knowledge acquisition, information quality, services, and visit efficiency. Emotional value captures surprise, pleasure, awe, and cultural resonance. Social value concerns interaction with companions, identity expression, and the capacity to share the experience with others. Research by Williams and Soutar [19] and Chen and Chen [5] suggests that these dimensions are not substitutes; together they shape evaluations of the overall experience.

In heritage settings, authenticity and cultural meaning make perceived value particularly integrated. Park et al. [20] and Rickly [2] show that evaluations of material remains, narrative credibility, and personal experience are closely connected. More recent studies indicate that digital interaction, immersive exhibition, and experience-economy design can simultaneously strengthen educational, aesthetic, emotional, and participatory value [3,4,9,10,21]. Visitors to an archaeological museum such as Sanxingdui may therefore be more likely to display jointly high or jointly low value perceptions than an isolated preference for only one dimension.

2.2 Visitor Heterogeneity and Latent Profile Analysis

Conventional market segmentation frequently relies on observable attributes such as age, gender, and occupation, but demographic variables do not always capture meaningful differences in cultural-tourism experience. McKercher [11] emphasized combinations of cultural motivation and experiential depth, while Poria et al. [12] showed that subjective relationships with heritage influence reasons for visiting. Later research developed multi-profile frameworks for cultural visitors [14] and demonstrated that museum visitors differ in experience processing, satisfaction, and loyalty [13,22].

Latent profile analysis is a probability-based person-centered method that identifies unobserved subgroups from continuous indicators. Unlike classifications imposed in advance, it compares models with different numbers of profiles and selects a solution by considering fit indices, classification accuracy, class size, and substantive interpretability [23,24,25]. Tourism studies have used related latent-class approaches to identify groups with different prosocial behaviors, spatial choices, and heritage preferences [15,16]. Applied to Sanxingdui, the method can determine whether heterogeneity reflects dimension-specific preferences or an overall gradient in experience intensity.

2.3 Research Questions

The study does not assume in advance that the data must yield knowledge-oriented, emotion-oriented, or social-sharing types. Instead, the number and form of profiles are data-driven. Three research questions are proposed:

RQ1: What latent experience profiles can be identified among Sanxingdui visitors on the basis of functional, emotional, and social value?

RQ2: Do the profiles differ in visit motivations, satisfaction, and behavioral intention?

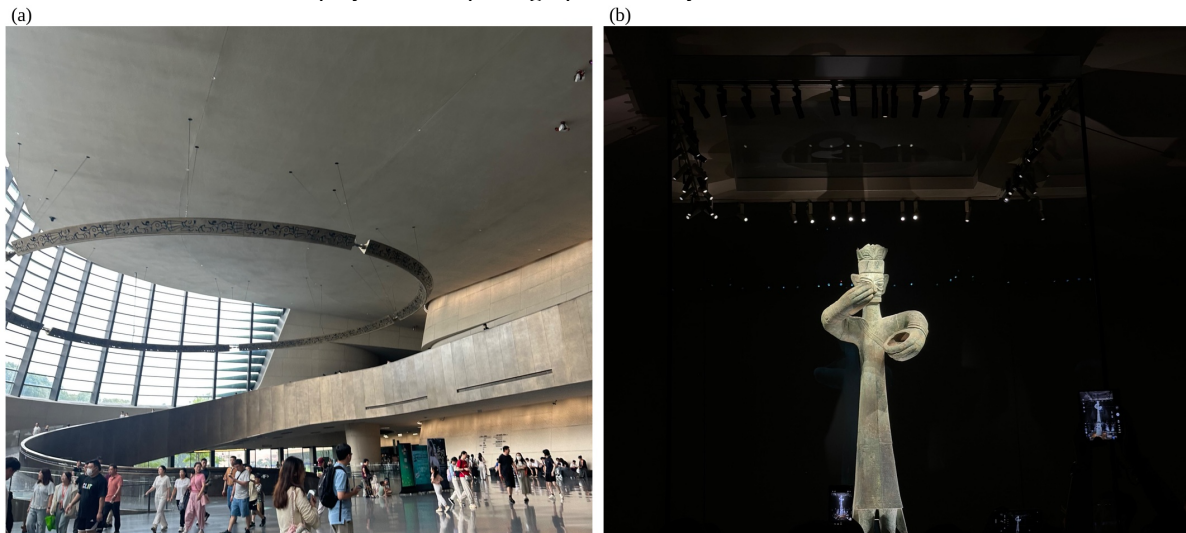
RQ3: Can gender, age, education, and first-visit status reliably distinguish profile membership?

3. Methodology

3.1 Case Setting and Field Context

The Sanxingdui Museum presents the archaeological heritage of the ancient Shu civilization through monumental bronzes, gold objects, jade, and multimedia interpretation. The author revisited the museum in 2026 and conducted non-participant field observation of public spaces, representative displays, and high-density visiting conditions. The photographs are used only to describe the research setting and support the managerial discussion; they are not part of the 2025 questionnaire dataset or the statistical analysis.

Figure 1: Field context at the Sanxingdui Museum: (a) public hall and circulation space; (b) representative bronze display. Source: photographs taken by the author in 2026



3.2 Sample and Data Preparation

A five-point Likert questionnaire was distributed online to respondents with prior experience of visiting Sanxingdui. The original file contained 372 records. Of these, 371 were submitted during the main survey period, while one additional response was submitted separately five days later. To maintain consistency with the analytical population used in the previous study and to avoid redefining the dataset during secondary analysis, the first 371 valid responses were retained. No core scale item contained missing data. Women

represented 52.02% of the sample, visitors aged 26-35 accounted for 33.69%, 61.46% held at least a bachelor's degree, and 84.37% were first-time visitors.

Table 1: Demographic characteristics of the sample (N = 371)

Variable	Category	n	%
Gender	Female	193	52.02
Gender	Male	178	47.98
Age	18 or below	6	1.62
Age	19-25	49	13.21
Age	26-35	125	33.69
Age	36-45	89	23.99
Age	46-60	84	22.64
Age	Above 60	18	4.85
Education	High school or below	44	11.86
Education	Junior college	99	26.68
Education	Bachelor's degree	179	48.25
Education	Master's degree or above	49	13.21
Occupation	Enterprise employee	213	57.41
Occupation	Government/public institution	35	9.43
Occupation	Professional/technical staff	29	7.82
Occupation	Self-employed	33	8.89
Occupation	Student	13	3.50
Occupation	Retired	5	1.35
Occupation	Other	43	11.59
First visit	Yes	313	84.37
First visit	No	58	15.63

3.3 Measures

The experience-value measures were adapted from the multidimensional perceived-value framework of Sweeney and Soutar [18] for an archaeological tourism context. Functional value was measured with three items addressing archaeological learning, interpretive information, and visit services. Emotional value was measured with three items covering surprise, enjoyment, and cultural resonance. Social value was measured with two items concerning shared topics with companions and social expression. Satisfaction was measured with two items, and behavioral intention with three items covering recommendation, revisit, and continued attention. Four single-item visit motivations captured knowledge acquisition, curiosity about ancient Shu civilization, shared experience with family or friends, and check-in or sharing at a popular attraction.

Cronbach's alpha ranged from 0.796 to 0.881, indicating acceptable reliability. Correlations among functional, emotional, and social value were 0.854, 0.795, and 0.822. These high associations suggest a common foundation underlying the multidimensional experience and caution against interpreting the dimensions as completely independent preference systems solely on the basis of average regression coefficients.

Table 2: Descriptive statistics and reliability of the main scales

Construct	Items	Mean	SD	Cronbach's α
Functional value	3	3.507	1.035	0.862
Emotional value	3	3.560	1.057	0.869
Social value	2	3.550	1.074	0.796
Satisfaction	2	3.578	1.064	0.815
Behavioral intention	3	3.562	1.064	0.881

3.4 Analytical Procedure

To keep the analysis parsimonious and interpretable, composite means were calculated for functional, emotional, and social value and then standardized. The three continuous dimensions served as profile indicators in Gaussian mixture models with two to five classes and class-specific diagonal covariance matrices. Model selection jointly considered log likelihood, AIC, BIC, sample-size-adjusted BIC (aBIC), entropy, minimum class size, parsimony, and substantive interpretability. Lower AIC, BIC, and aBIC values generally indicate better fit, while entropy values closer to one indicate clearer classification [23,25].

After the preferred solution was selected, one-way analysis of variance compared the four motivations, satisfaction, and behavioral intention, with η^2 reported as an effect-size measure. Welch pairwise tests with Bonferroni adjustment were conducted for satisfaction and behavioral intention. Chi-square tests then examined associations between profile membership and gender, collapsed age groups, education, and first-visit status. All statistical tests were two-sided with an alpha level of 0.05.

3.5 Ethics and Data-reuse Disclosure

Participation was voluntary and anonymous, and responses were used only for academic purposes. This article reports a secondary analysis of the same 371-response dataset used by Wu [17]. The earlier paper examined variable-centered mediation relationships among perceived value, satisfaction, and behavioral intention. The present paper addresses a distinct person-centered question, applies latent profile analysis to identify subgroups, and does not repeat the earlier mediation models, hypotheses, or conclusions. This disclosure is provided to ensure transparency concerning the dataset and prior output.

4. Results

4.1 Comparison of Latent Profile Solutions

As shown in Table 3, AIC and aBIC decreased as the number of profiles increased. The five-profile model had the lowest AIC and aBIC, but its BIC (1778.535) was slightly higher than that of the four-profile model (1776.573), and entropy decreased from 0.918 to 0.852. Substantively, the five-profile model primarily divided adjacent medium-to-high groups without producing a new configuration of value dimensions. The smallest group in the four-profile solution represented 14.3% of the sample, avoiding a very small class, while the solution retained strong classification quality and a more parsimonious interpretation. The four-profile solution was therefore selected.

Table 3: Fit indices for two- to five-profile models

Profiles	LogLik	AIC	BIC	aBIC	Entropy	Class-size range
2	-1208.650	2443.301	2494.211	2452.967	0.927	147-224 (39.6%-60.4%)
3	-1089.605	2219.209	2297.533	2234.080	0.889	81-171 (21.8%-46.1%)
4	-808.418	1670.836	1776.573	1690.911	0.918	53-153 (14.3%-41.2%)
5	-788.692	1645.384	1778.535	1670.664	0.852	51-121 (13.7%-32.6%)

4.2 Characteristics of the Four Visitor Profiles

Table 4 and Figure 2 present the mean scores for functional, emotional, and social value. The three lines are broadly parallel within each profile. Heterogeneity is therefore expressed mainly as a hierarchy of overall experience intensity rather than as extreme combinations in which one value dimension is high and the others are low. The profiles were named according to their means and sample shares.

Profile 1, the low-experience-perception group, contains 66 visitors (17.8%). Its three value means range from 2.04 to 2.09, clearly below the scale midpoint. Its satisfaction mean is nevertheless 3.02, indicating that the group should not be labeled strongly dissatisfied; rather, it has not formed a clear and positive recognition of the visit's value.

Profile 2, the moderate-experience-perception group, contains 153 visitors (41.2%) and is the largest profile. Its three value means range from 3.13 to 3.22, and satisfaction and behavioral intention remain moderate. These visitors acknowledge the basic value of the visit, but the experience has not consistently translated into high satisfaction, active recommendation, or strong revisit intention.

Profile 3, the elevated-experience-perception group, contains 99 visitors (26.7%). Functional, emotional, and social value all exceed 4.29, while satisfaction and behavioral intention approach four points. Relative to the moderate profile, the difference is not confined to one dimension; learning, emotional resonance, and social-sharing value increase together.

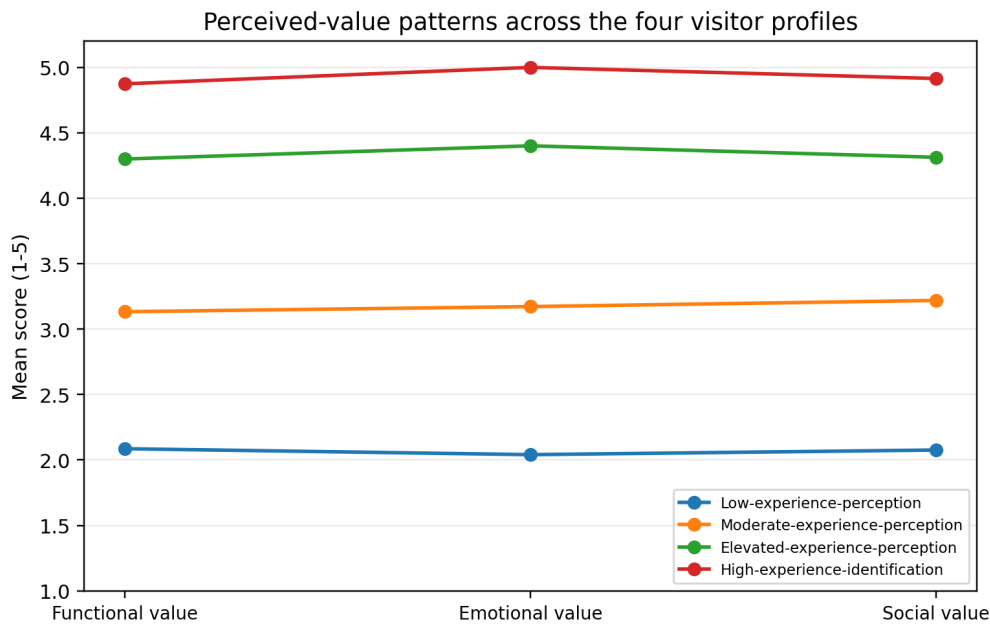
Profile 4, the high-experience-identification group, contains 53 visitors (14.3%). All three value dimensions are near the scale ceiling, with emotional value reaching a mean of 5.00. Satisfaction and behavioral intention

are both approximately 4.69. These visitors recognize the functional quality of the exhibition while also displaying strong emotional involvement and social-expression potential.

Table 4: Means and standard deviations of the core variables across profiles

Profile	n (%)	Functional	Emotional	Social	Satisfaction	Behavioral intention
Low experience	66 (17.8%)	2.086 (0.398)	2.040 (0.368)	2.076 (0.549)	3.023 (0.825)	2.894 (0.889)
Moderate experience	153 (41.2%)	3.133 (0.537)	3.172 (0.497)	3.219 (0.630)	3.157 (0.981)	3.194 (0.932)
Elevated experience	99 (26.7%)	4.300 (0.489)	4.401 (0.347)	4.313 (0.537)	4.005 (0.882)	3.976 (0.925)
High identification	53 (14.3%)	4.874 (0.229)	5.000 (0.000)	4.915 (0.190)	4.689 (0.645)	4.686 (0.583)

Figure 2: Perceived-value patterns across the four visitor profiles



4.3 Differences in Motivations, Satisfaction, and Behavioral Intention

One-way analyses of variance revealed significant overall differences in all four visit motivations, satisfaction, and behavioral intention (all $p < 0.001$). Effect sizes ranged from $\eta^2 = 0.228$ to 0.320 , indicating differences of practical as well as statistical importance. Motivations concerning knowledge, curiosity, companionship, and check-in or sharing all became stronger in the elevated and high profiles. High-value experience therefore does not appear to be driven by only one knowledge or social motive; rather, it is associated with jointly strong expectations across several motives.

The group pattern for satisfaction and behavioral intention is particularly informative. Bonferroni-adjusted pairwise comparisons showed no significant difference in satisfaction between the low and moderate profiles, and the difference in behavioral intention also failed to reach the adjusted significance level. The remaining major profile comparisons were significant. Moving from low to moderate perceived value therefore did not generate a proportional increase in satisfaction or loyalty-related intention. Marked increases emerged once visitors entered the elevated profile. This can be described cautiously as a threshold-like group pattern rather than a strictly linear progression, although the cross-sectional data cannot establish a causal threshold.

Table 5: Differences in motivations and outcomes across the experience profiles

Variable	Low	Moderate	Elevated	High	F	p	η^2
Knowledge motivation	3.121	3.085	3.869	4.566	36.069	<0.001	0.228
Curiosity about ancient Shu	3.152	2.980	3.859	4.660	43.458	<0.001	0.262
Companionship motivation	3.030	3.039	4.000	4.623	43.858	<0.001	0.264
Check-in/sharing motivation	3.045	3.163	3.949	4.698	38.500	<0.001	0.239
Satisfaction	3.023	3.157	4.005	4.689	55.551	<0.001	0.312
Behavioral intention	2.894	3.194	3.976	4.686	57.606	<0.001	0.320

4.4 Demographic Characteristics and Profile Membership

Gender, age, education, and first-visit status were not significantly associated with profile membership (Table 6). The experience hierarchy cannot therefore be reduced to demographic assumptions such as younger visitors being primarily social or highly educated visitors being primarily knowledge oriented. Exploratory occupation cross-tabulations contained several cells with low expected frequencies and were not sufficiently robust for formal interpretation. Overall, behavioral and experiential segmentation is more informative in this case than segmentation based only on basic demographic attributes.

Table 6: Chi-square tests of demographic characteristics and profile membership

Variable	χ^2	df	p	Conclusion
Gender	0.289	3	0.962	Not significant
Age (four collapsed groups)	10.172	9	0.337	Not significant
Education	13.842	9	0.128	Not significant
First-time visit	6.032	3	0.110	Not significant

5. Discussion

5.1 Heterogeneity is Primarily a Gradient of Experience Intensity

The central finding is that Sanxingdui visitors are heterogeneous, but the heterogeneity is not organized as mutually exclusive functional, emotional, and social preference types. Instead, all three dimensions rise together across a graded structure. This result is consistent with the emphasis on depth of involvement in cultural-tourist classification [11], while extending recent segmentations based on specific preferences or spatial choices [14,16]. At Sanxingdui, interpretive learning, the visual impact of artifacts, and public circulation of the site's symbolic imagery are closely integrated. Once visitors evaluate the central experience positively, knowledge, emotion, and social-sharing value tend to strengthen simultaneously.

The finding also helps explain the high correlations among the original value dimensions. Separate average effects can make shared experiential foundations appear to be fully independent drivers. The person-centered results suggest that the more useful managerial question is not which of the three values should replace the others, but how visitors can be moved from basic acknowledgment to integrated identification.

5.2 The Transition from Moderate to Elevated Experience is Managerially Critical

The moderate profile represents 41.2% of the sample and is therefore the dominant segment. Its members evaluate the three value dimensions as neutral to moderately positive, but their satisfaction and behavioral intention are not significantly higher than those of the low profile after adjustment. In contrast, the elevated profile shows pronounced increases in both outcomes once all three value dimensions exceed four points. This finding is compatible with established relationships among experience quality, satisfaction, and loyalty in heritage tourism [5,6,7,26], but it adds that the average linear relationship may conceal uneven transitions across groups.

The result should not be interpreted as an exact numerical cut-off. A more defensible interpretation is that multiple forms of value may need to become jointly strong before they consistently translate into high satisfaction and positive intention. Merely adding more information, creating an isolated photo spot, or increasing entertainment in a single exhibit may be insufficient to produce this transition.

5.3 Multiple Motivations Accompany High Experience Identification

The high-identification profile records the highest means for knowledge, curiosity, companionship, and check-in or sharing motivations. This supports the argument by Poria et al. [12] that relationships with heritage and reasons for visiting jointly shape the experience, and it corresponds with evidence that museum visitors differ in their processing of experience and revisit intention [13,22]. At Sanxingdui, learning, exploration, companionship, and sharing are not necessarily competing motives; a coherent exhibition can allow them to reinforce one another.

5.4 Theoretical Contributions

First, the study advances Sanxingdui archaeological tourism research from a variable-centered to a person-centered perspective, showing that meaningful experiential subgroups remain beneath statistically significant average relationships. Second, it avoids imposing attractive but unsupported labels such as knowledge-only, emotion-only, or social-only tourists. The four-level structure demonstrates that cultural-visitor heterogeneity can take the form of overall intensity rather than distinctive shapes. Third, the marked increase in satisfaction and behavioral intention between the moderate and elevated profiles provides supplementary evidence that the conversion of perceived value into loyalty-related outcomes may be uneven across visitors.

6. Managerial and Marketing Implications

First, the moderate-experience-perception profile should be treated as the priority conversion segment. It is the largest group and already acknowledges basic exhibition value, but has not yet developed strong satisfaction or intention. Managers can provide layered interpretation around major artifacts: concise guidance for rapid visitors, optional in-depth content for knowledge seekers, and clear narrative links that connect individual objects into a coherent story of ancient Shu civilization.

Second, isolated improvements should be replaced by coordinated design linking interpretation, emotional arousal, and social sharing. Digital and interactive technologies can strengthen education, accessibility, and immersion [3,4,9,21], but technology should support artifact authenticity and narrative comprehension rather than operate as detached entertainment. For iconic bronzes, interpretation can integrate archaeological discovery, production techniques, ritual hypotheses, and visually shareable information so that all three value dimensions rise together.

Third, the high-identification profile can be served through extended participation, including specialist talks, digital archives, membership content, temporary-exhibition previews, and co-creation of cultural products. For the low profile, the immediate priority is to reduce cognitive and navigational barriers through clear wayfinding, readable information, and recognizable highlights, rather than increasing information density indiscriminately.

Fourth, field observation indicates that popular galleries can become highly dense during peak periods. Crowding was not measured in the questionnaire and no causal claim is made here. Nevertheless, the context suggests that layered-experience strategies should be combined with timed entry, one-way circulation, dwell-time guidance at major showcases, and digital queue information so that high density does not undermine value conversion.

Figure 3: Example of a high-density visiting context. Source: photograph taken by the author in 2026; shown for contextual illustration only



7. Limitations and Future Research

The study has four main limitations. First, the data come from a single heritage attraction and a non-probability sample, so the transferability of the four profiles to other archaeological sites or museums requires testing. Second, cross-sectional self-reported data identify associations rather than causal effects; they cannot demonstrate that motivations cause profile membership or confirm the direction of the threshold-like pattern. Third, composite dimensions were used as profile indicators to keep the model accessible and interpretable. Future research with larger samples could estimate item-level profiles and validate them in an independent sample. Fourth, the questionnaire did not directly measure authenticity, awe, perceived crowding, digital-interaction quality, or place attachment. Adding these variables would permit stronger tests of how specific exhibition designs affect different profiles.

Longitudinal research could compare pre-visit expectations, on-site experience, and post-visit memory. Multi-case studies across Sanxingdui, the Jinsha Site Museum, and the Museum of the Terracotta Warriors and Horses could also test whether the graded experience structure remains stable across different forms of archaeological heritage tourism.

8. Conclusion

Using 371 questionnaires from Sanxingdui visitors, this study identifies four groups: low experience perception, moderate experience perception, elevated experience perception, and high experience identification. Visitor heterogeneity is expressed primarily as a hierarchy in which functional, emotional, and social value rise together, rather than as mutually exclusive single-value preferences. The moderate profile is the largest group and the segment with the greatest potential for conversion. Satisfaction and behavioral intention increase markedly in the elevated and high-identification profiles, suggesting that movement from basic acknowledgment to integrated identification may require the joint strengthening of multiple forms of value. Basic demographic characteristics do not reliably explain profile membership, making motivation- and experience-based segmentation more useful than simple demographic segmentation.

Sanxingdui and comparable archaeological heritage attractions should therefore avoid pursuing a single functional or promotional metric in isolation. Clear interpretation, emotional storytelling, interactive participation, socially shareable content, and on-site flow management should operate as an integrated system that helps more visitors cross the critical transition from moderate to elevated experience.

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Conflicts of Interest

The authors declare no conflict of interest.

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