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# Development and Psychometric Validation of the Museum Quality and Museum Perceived Value Scales

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**Abstract**

Reliable and culturally appropriate measurement instruments are essential for advancing museum research and enabling meaningful comparisons across studies. However, evidence regarding the psychometric performance of existing scales outside their original cultural settings remains limited. This study aimed to develop and psychometrically validate integrated measures of museum quality and museum perceived value in the Slovenian museum context by combining newly developed items with items adapted from established measurement instruments. Scale development followed a multi-study design. First, measurement items were developed and evaluated through expert assessment to establish content validity. The scales were then refined using exploratory factor analysis and subsequently validated through confirmatory factor analysis to assess their factorial structure, reliability, convergent validity, and discriminant validity using an independent sample of museum visitors. Finally, nomological validity was examined by testing the relationships between museum quality, perceived value, and visitor satisfaction. The findings supported the proposed multidimensional structure of both scales and demonstrated satisfactory psychometric properties. The validated instruments provide reliable measures for assessing museum quality and perceived value in the Slovenian museum context and offer a methodological foundation for future research and further validation of these constructs in other cultural settings. Replication with larger samples is recommended to obtain more robust estimates of latent factor correlations.

**Keywords:** museum quality; museum perceived value; scale development; psychometric validation

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## 1. Introduction

Reliable measurement is the foundation of cumulative scientific knowledge. Theoretical advancements and meaningful comparisons across studies depend on measurement instruments that accurately capture the constructs being investigated. This is particularly important in museum research, where visitor evaluations are increasingly used to explain behavioural outcomes, assess museum performance, and support evidence-based management. However, despite the growing emphasis on museum quality and perceived value in explaining visitor experiences, evidence regarding the validity of existing measurement instruments outside their original cultural settings remains limited. Most available scales have been developed and validated within specific cultural contexts and subsequently applied in new cultural settings with only limited psychometric verification, raising concerns

about the comparability of empirical findings and the validity of conclusions drawn from their use.

Over the past decades, museums have transformed from institutions primarily focused on collecting, preserving, and exhibiting cultural heritage into visitor-oriented organisations that aim to create meaningful educational, cultural, and experiential value (P. Li, 2024). While conservation and research remain fundamental to their mission, contemporary museums are increasingly evaluated based on the quality of experiences they provide and their ability to meet visitor expectations (Deng et al., 2023). Beyond preserving cultural heritage, museums also serve as spaces for education, recreation, and cross-cultural understanding, further reinforcing the importance of delivering high-quality visitor experiences (Preko et al., 2020). This transformation reflects broader trends in the experience economy, heightened competition in cultural tourism, and a growing emphasis on visitor engagement. Consequently, understanding how visitors perceive and evaluate museum experiences has become central to both museum marketing research and managerial practice. Visitor evaluations not only influence satisfaction, intention to revisit, loyalty, and positive word-of-mouth but also provide museums with valuable insights for improving exhibitions, interpretation, visitor services, and strategic decision-making (Xie, 2024).

Among the constructs most frequently used to explain visitor evaluations, museum quality and museum perceived value occupy critical positions. Although conceptually distinct, these constructs describe complementary aspects of the museum experience. Museum quality refers to visitors' evaluation of the museum's overall performance, including exhibitions, interpretation, physical environment, accessibility, staff interactions, and supporting services. In contrast, museum perceived value reflects visitors' overall assessment of the benefits gained from the museum experience relative to the resources invested. Importantly, perceived value extends beyond functional or economic considerations to encompass a broad range of educational, emotional, social, and other experiential benefits that visitors derive from museum experiences (Tom Dieck & Jung, 2017). Together, these complementary constructs provide a comprehensive basis for understanding visitor evaluations, making the availability of valid and culturally appropriate measurement instruments particularly important (Oriade & Schofield, 2019).

The increasing importance of these constructs has spurred significant efforts to develop reliable measurement instruments tailored to museum contexts. Early museum research primarily adopted generic service quality frameworks, notably SERVQUAL (Parasuraman et al., 1988). Although SERVQUAL has been widely used across various service industries, subsequent research has questioned its suitability for museums, arguing that museum experiences differ from traditional service encounters. Visitors evaluate not only service delivery but also authenticity, interpretation, educational experiences, exhibitions, and cultural meaning (Triantafillos & Stavros, 2023). These limitations have led to the development of museum-specific measurement approaches, most notably HISTOQUAL (Frochot & Hughes, 2000), which expanded traditional service quality dimensions by incorporating characteristics unique to heritage attractions. Since then, researchers have continued to refine museum-quality instruments by introducing additional dimensions, such as communication, exhibition attractiveness, accessibility, educational content, and museum environment, reflecting the multidimensional nature of visitors' evaluations (Kelpšienė et al., 2024). Beyond museums, researchers have also developed context-specific service quality instruments for other cultural settings, such as ARTQUAL for cultural centres, theatres, concert halls, and art galleries, further illustrating that generic service quality scales often fail to capture the unique characteristics of cultural experiences (Ijadi Maghsoodi et al., 2019).

Traditionally, perceived value has been viewed as the trade-off between perceived benefits and sacrifices (Zeithaml, 1988). However, studies conducted in museum settings show that visitors derive value from a broader range of benefits beyond functional performance alone. Armbrecht (2014) proposed a framework for understanding the perceived value of cultural institutions, which includes educational, social, health, identity, image, and economic (financial) dimensions, highlighting that museums contribute significant societal and personal value beyond immediate consumption. Similarly, Z. Li et al. (2021) found that visitors' purchase intentions are mainly influenced by experiential and innovation value rather than economic concerns. Xie (2024) further illustrated that digital museum services impact multiple aspects of visitors' perceived value concurrently. Together, these studies indicate that the museum's perceived value is inherently multidimensional and closely tied to the specifics of the museum experience. Recent research further confirms that visitors' perceived value is inherently museum-specific and should be conceptualised from the visitors' perspective. Using a visitor-centred approach, Cao and Li (2026) developed and validated a seven-dimensional scale of museum perceived value, demonstrating that visitors evaluate museums through multiple complementary dimensions rather than a single overall judgment.

The growing number of measurement instruments has advanced museum research significantly, but has also exposed important conceptual and methodological inconsistencies. While existing studies agree that both museum quality and perceived value are multidimensional constructs, there is less consensus on their underlying dimensions. Adaptations of the HISTOQUAL framework primarily emphasise factors such as communication, responsiveness, tangibles, accessibility, and supporting services. However, more recent studies have introduced additional dimensions, including exhibition attractiveness (Chae, 2026) and innovation (Z. Li et al., 2021). Moreover, the conceptualisation of museum perceived value has expanded from traditional functional and economic perspectives toward a broader multidimensional understanding that incorporates educational, cultural, symbolic, emotional, social, and experiential aspects of museum experiences (Z. Li et al., 2021). These developments reflect the changing nature of museums and suggest that the dimensionality and psychometric performance of existing instruments may differ across institutional and cultural settings.

Despite these advancements, the field continues to evolve through the development of museum-specific measurement frameworks. Recent conceptual frameworks, such as the Museum Exhibition User Experience (MEUX) framework (King et al., 2023) and the MUSEQUAL model (Kelpšienė et al., 2024), have broadened the understanding of museum quality by incorporating experiential, exhibition-centred, and museum-specific dimensions beyond traditional service-quality approaches. While these developments represent important conceptual progress, they also increase the need for rigorous validation across different cultural and institutional contexts. Despite these conceptual and methodological advances, three important methodological limitations remain evident in the literature. Firstly, validation studies have mainly been conducted within individual countries and museum systems, particularly in China and selected European settings (Recuero Virto et al., 2017), limiting evidence regarding the applicability of both established and newly developed instruments outside the contexts in which they were originally developed and validated. Second, although many studies examine the relationships among museum quality, perceived value, visitor satisfaction, and behavioural intentions, relatively few prioritise rigorous psychometric validation of the measurement instruments underlying these structural models. Consequently, robust evidence regarding factorial stability, construct validity, and reliability following adaptation to different cultural contexts remains limited. Third, researchers frequently adapt existing scales to suit specific museums or research objectives

without comprehensive psychometric re-evaluation, making comparisons across studies difficult. As a result, observed differences in empirical findings may reflect measurement inconsistencies rather than genuine differences in visitors' perceptions.

These limitations highlight a broader challenge in museum marketing research. Since museum quality and perceived value are latent constructs, meaningful comparisons across museums, visitor groups, and countries rely on measurement instruments that demonstrate conceptual equivalence and robust psychometric properties. However, simple linguistic translation alone cannot ensure such equivalence, as respondents from different cultural backgrounds may interpret survey items differently due to variations in museum traditions, educational systems, visitor expectations, and cultural values. Accordingly, the International Test Commission Guidelines for Translating and Adapting Tests (ITC, 2017) emphasise that cross-cultural adaptation should extend beyond linguistic translation to include systemic evaluation of conceptual, linguistic, and psychometric equivalence. Furthermore, recent psychometric research highlights the importance of empirically verifying structural validity, discrimination, and reliability when adapting measurement instruments to new cultural contexts, rather than assuming that their measurement properties remain unchanged (Chomeya & Piyakun, 2022). Therefore, rigorous validation following linguistic and cultural adaptation is not merely a technical procedure but an essential prerequisite for ensuring that measurement instruments remain valid when applied in new cultural contexts.

The Slovenian Museum context presents an opportunity to address this methodological gap. Although European countries share certain cultural and institutional characteristics, research suggests that meaningful cultural differences persist even within Europe (Kaasa et al., 2014). Such differences have been shown to influence consumers' perceptions of value and related evaluations across service contexts (Croitoru et al., 2024; Sabiote et al., 2013). Moreover, recent museum research indicates that even intracultural differences may moderate the relationships among service quality, perceived value, and behavioural intentions (Zhang et al., 2026), highlighting the importance of validating measurement instruments before their use within specific cultural contexts. Recent studies from geographically and culturally adjacent Central and Southeastern European countries further demonstrate a growing regional interest in museum visitor experience. In Hungary, Jászberényi and Bodnár (2024) examined the dimensions of museum experience. They showed that contemporary museums increasingly seek to create memorable, engaging, and participatory experiences that influence visitors' subsequent intentions. In Croatia, Komarac et al. (2024) investigated how edutainment and perceived authenticity contribute to visitor satisfaction. Together, these studies indicate that visitor-centred museum research is developing across the region, while comparable evidence from Slovenia remains scarce. Although Slovenian museums are increasingly adopting visitor-oriented approaches and face similar challenges, including digital transformation, heightened competition for visitors, and rising expectations for the visitor experience, empirical research on visitors' perceptions remains relatively limited. Although Slovenian museums have previously used locally developed visitor-evaluation questionnaires, including measures of exhibition quality, visitor experience, satisfaction, and recommendation (Kostric, 2012), no prior study has thoroughly validated instruments that measure both museum quality and perceived value in the Slovenian cultural context. As a result, researchers and museum professionals lack psychometrically validated instruments to systematically assess visitors' perceptions and make reliable comparisons with findings reported in the international literature.

Although several museum-quality and museum-perceived value instruments have been proposed, they differ considerably in their conceptualisation, dimensionality, and intended application. The present study focuses on the selected instruments because they

represent comprehensive multidimensional measures that have demonstrated promising psychometric properties and have the potential to facilitate more consistent measurement across museum settings. Nevertheless, evidence of their applicability beyond the original cultural context remains limited, thereby warranting their validation in the Slovenian museum context.

This study contributes to the existing literature in three significant ways. First, it advances prior research by developing integrated museum quality and museum perceived value scales that combine newly developed and adapted measurement items and by psychometrically validating these instruments in the Slovenian museum context. Second, unlike previous validation studies that typically focused on a single construct, this research simultaneously validates two theoretically distinct yet complementary constructs, namely museum quality and museum perceived value. This dual-validation approach provides a coherent methodological framework by developing and evaluating both instruments within the same research context and validation process. Applying the same validation procedures to both scales enables a consistent assessment of their psychometric properties and allows their empirical distinctiveness to be evaluated through discriminant validity. Additionally, establishing the reliability and validity of both instruments before examining their theoretically expected relationships with visitor satisfaction provides a sound basis for measuring and investigating complementary aspects of visitors' evaluations of museum experiences. Finally, by establishing reliable and valid measurement instruments, this study lays a methodological foundation for future research exploring the relationships among museum quality, perceived value, and visitor satisfaction within museums and related cultural institutions.

This study aims to develop and psychometrically validate integrated museum quality and museum perceived value scales in the Slovenian museum context by combining newly developed and adapted measurement items. Specifically, this study examines the factorial structure, internal consistency, convergent validity, and discriminant validity of both instruments to determine whether they offer reliable and valid measures of visitors' perceptions. Accordingly, this study addresses the following research question:

RQ: What dimensional structure and psychometric properties characterise the developed museum quality and museum perceived value scales in the Slovenian museum context?

By establishing psychometrically sound instruments for these two central constructs in museum research, this study enhances methodological rigour, improves the comparability of empirical findings within Slovenian museum research and in future validation studies conducted in other cultural settings, and supports future research on museum visitor behaviour.

## 2. Literature Review

### *2.1. Museum Quality*

Museum quality is widely recognised as a multidimensional construct that extends beyond traditional service quality by integrating both functional and experiential aspects of museum visits. Building on the service quality literature, museum quality can be understood as the extent to which a museum's facilities, staff interactions, exhibition content, and supporting services meet or exceed visitors' expectations (Daskalaki et al., 2020). Rather than reflecting a single evaluation, visitors assess museum service quality through multiple interrelated dimensions that collectively shape their overall museum experience (Marković et al., 2013).

The conceptual foundation of museum quality originates from the SERVQUAL framework, which conceptualises service quality through dimensions of tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman et al., 1988). Although SERVQUAL

has been widely applied across service industries (Ladhari, 2009), its generic structure has proven insufficient for heritage and museum settings (Triantafillos et al., 2023). This limitation is also supported by broader theoretical perspectives, including the Experience Economy framework, which emphasises that memorable and immersive experiences represent a distinct source of value in experiential consumption (Pine & Gilmore, 1998), and Servicescape theory, which highlights the role of the physical environment in shaping visitors' cognitive, emotional, and behavioural responses (Wakefield & Blodgett, 1996). Together, these perspectives suggest that museum visitors evaluate not only service delivery but also exhibitions, interpretation, and the overall museum experience. Consequently, researchers have developed museum-specific quality frameworks, beginning with HISTOQUAL (Triantafillos et al., 2023). More recently, Kelpšienė et al. (2024) proposed the MUSEQUAL framework, which conceptualises museum quality through five complementary dimensions: display, subject matter, facilities, services, and staff. Unlike earlier service-quality models that primarily emphasise service delivery, MUSEQUAL explicitly distinguishes between the physical presentation of exhibitions and their intellectual and interpretive content, reinforcing the view that museum quality extends beyond functional service encounters to encompass the educational, cultural, and experiential value created through exhibitions.

Empirical evidence consistently supports the multidimensional nature of museum quality (Wu & Li, 2015). Studies applying SERVQUAL and HISTOQUAL have confirmed their usefulness in evaluating museum services (Cheng & Wan, 2012; Kowalska & Ostręga, 2020; Nowacki, 2005), whereas museum-specific models have identified dimensions including the physical environment, accessibility, presentation quality, personnel-related characteristics, and experiential attributes as key determinants of visitor satisfaction and behavioural intentions (Wu & Li, 2015; Forgas-Coll et al., 2017). Similarly, Radder and Han (2013) conceptualised perceived museum quality across four complementary dimensions: service interaction, service evidence, product functionality, and product enrichment, thereby further supporting the multidimensional nature of museum quality. Importantly, recent evidence suggests that service quality remains a stronger predictor of visitor satisfaction, revisit intentions, and word-of-mouth than customer experience alone, highlighting its continued relevance in cultural heritage settings (de Rooij et al., 2025).

Among the dimensions most consistently identified in previous research, the physical environment represents one of the strongest determinants of visitors' evaluations of museum quality (Marković & Janković, 2019). Drawing on the Servicescape framework (Bitner, 1992) and the Stimulus-Organism-Response model (Mehrabian & Russell, 1974), the physical environment encompasses the tangible and ambient characteristics of museum spaces that shape visitors' cognitive, emotional, physiological, and behavioural responses. Because museum experiences are largely intangible prior to consumption, visitors rely heavily on environmental cues such as exhibition design, lighting, cleanliness, spatial layout, and signage when evaluating quality (Dedeoğlu et al., 2018; Lee & Kim, 2014). Museum research consistently demonstrates that exhibition atmospherics, ambient conditions, and exhibition space aesthetics positively influence visitors' museum experiences, service evaluations, and positive word-of-mouth intentions (Forrest, 2013; Conti et al., 2020; Erdoğan & Enginkaya, 2023). Accordingly, the physical environment constitutes a fundamental dimension of museum quality.

A second core dimension is personnel quality, reflecting visitors' evaluations of employees' competence, responsiveness, courtesy, assurance, and empathy during service encounters (Parasuraman et al., 1988). Building on early service encounter theory, more recent research demonstrates that employees' behaviours during customer interactions play a crucial role in shaping customer satisfaction and service evaluations (Bitner et al., 1994;

Farrell et al., 2001). Beyond providing operational support, museum staff serve as cultural mediators, facilitating interpretation, learning, and visitor engagement. This perspective is consistent with the Gaps Model of Service Quality (Parasuraman et al., 1985) and Service-Dominant Logic, which views frontline employees as key actors in value co-creation (Vargo & Lusch, 2004; Santos-Vijande et al., 2016). Previous studies have consistently shown that employee behaviour strongly influences service evaluations across industries (Ramsaran-Fowdar, 2007). Within museums, visitors' perceptions of personnel quality vary across museum types, while employees' knowledge, helpfulness, responsiveness, and willingness to assist visitors have been identified as important components of perceived museum service quality (Cheng & Wan, 2012). Consequently, personnel quality represents an essential interpersonal dimension of museum quality.

While physical environment and personnel quality primarily capture the functional aspects of museum services, exhibition originality reflects the experiential uniqueness of museum visits. Originality refers to visitors' perceptions of an exhibition's distinctiveness relative to familiar alternatives and encompasses both cognitive and affective evaluations of novelty. Although originality has often been examined indirectly through related constructs such as authenticity and novelty, research demonstrates that authentic, engaging, and distinctive cultural experiences enhance visitor satisfaction, post-visit engagement, aesthetic experience, and loyalty (Tjokrosaputro et al., 2026). The Museum Exhibition User Experience (MEUX) model further emphasises the importance of hedonic qualities in shaping museum experiences, demonstrating that different exhibitions generate qualitatively different visitor experiences (King et al., 2024). Although other museum-quality frameworks emphasise authenticity and educational content, originality captures visitors' perceptions of exhibitions as distinctive and memorable experiences. Because contemporary museums increasingly compete through unique visitor experiences rather than collections alone, originality represents an important experiential component that complements traditional service quality dimensions.

Collectively, previous research demonstrates that museum quality is a multidimensional construct encompassing both functional and experiential aspects of museum visits. However, despite growing agreement on its multidimensional nature, substantial variation remains in the dimensions included in existing measurement instruments. Accordingly, the present study focuses on physical environment and experience, quality of personnel, and originality, as these dimensions jointly capture both functional and experiential aspects of museum quality. Physical environments and personnel represent established components of service quality in museum settings. In contrast, originality captures the distinctive, experiential character of exhibitions, which is less explicitly represented in traditional service-quality frameworks. The selected structure provides a parsimonious yet conceptually broad representation of museum quality.

### 2.2. Museum Perceived Value

Perceived value is widely recognised as consumers' overall evaluation of a product or service based on the comparison between the benefits received and the sacrifices incurred. The seminal conceptualisation proposed by Zeithaml (1988) defines perceived value as a subjective assessment of what is received relative to what is given, emphasising that value depends on consumers' perceptions rather than objective product characteristics. Zeithaml (1988) further demonstrated that consumers interpret value in multiple ways—as low price, the quality received for the price paid, fulfilment of desired benefits, or the overall exchange of benefits and sacrifices. Building on this perspective, subsequent research has consistently characterised perceived value as a multidimensional, comparative, and context-dependent construct that emerges from interactions between consumers and

their consumption experiences (Sánchez-Fernández & Iniesta-Bonillo, 2007). Owing to its strong influence on satisfaction, loyalty, and competitive advantage, perceived value has become a central concept in marketing and tourism research (Boksberger & Melsen, 2011).

The theoretical foundation of perceived value is rooted in the benefits–sacrifices framework, which proposes that consumers evaluate products and services by balancing perceived benefits against the monetary and non-monetary sacrifices required to obtain them (Zeithaml, 1988). Rather than evaluating price in isolation, consumers assess products and services across multiple value dimensions, with price being only one component of overall perceived value (Kantamneni & Coulson, 1996). This perspective has been extended by arguing that value should be evaluated across the entire consumption process from acquisition and consumption to post-consumption evaluations, thereby integrating pre-purchase expectations with post-purchase experiences (Sánchez et al., 2006; Roig et al., 2006). Empirical evidence further suggests that both monetary and non-monetary sacrifices jointly determine consumers' overall value assessments (Agarwal & Teas, 2001).

This multidimensional conceptualisation has been reflected in the development of perceived value measurement scales. Although both unidimensional and multidimensional approaches have been proposed, the latter provides a more comprehensive understanding of the complexity of experiential consumption (Sánchez-Fernández & Iniesta-Bonillo, 2007). Among the most influential instruments, the PERVAL scale conceptualises perceived value through emotional, social, functional, and price-related dimensions (Sweeney & Soutar, 2001). In contrast, the SERV-PERVAL framework extends this approach to tourism by incorporating monetary and behavioural prices, with time and effort as non-monetary sacrifices (Petrick, 2002). These multidimensional frameworks provide the conceptual basis for measuring perceived value in museum experiences.

Empirical research consistently supports the multidimensional nature of perceived value in museum and tourism contexts. Beyond educational outcomes, museum visitors perceive value through emotional, social, aesthetic, and restorative experiences, reflecting the diverse benefits that museum experiences provide (Chan, 2009; Packer, 2008). Likewise, Z. Li et al. (2021) proposed a six-dimensional framework of perceived value for museum cultural and creative products, comprising quality, social, price, innovation, educational, and experiential value. They demonstrated that innovation and experiential value exert the strongest influence on purchase intentions. Using text mining of museum visitor reviews, Chen et al. (2025) further distinguished between subjective dimensions (e.g., aesthetic, emotion, service, and design) and objective dimensions (e.g., quality, price, culture, and function), identifying aesthetic and social value as the most influential. Extending previous multidimensional frameworks, Cao and Li (2026) developed a visitor-centred perceived value scale comprising education, exhibition, entertainment, leisure, escape, mark, and social dimensions, providing further evidence that museum perceived value reflects multiple complementary facets of the museum experience rather than a single global evaluation. In museum settings, perceived value is not created solely by the institution but is co-created through visitors' prior knowledge, planning, active participation, and interactions during the visit (Antón et al., 2018).

Although several multidimensional museum perceived-value frameworks have recently been proposed, including visitor-centred conceptualisations with additional experiential dimensions, the present study adopts the established benefits–sacrifice perspective. Accordingly, perceived value is conceptualised through four dimensions: emotional and social benefits, representing what visitors gain from the museum experience, and monetary and non-monetary price, representing the sacrifices associated with obtaining it.

These dimensions were selected because they provide a balanced representation of the two fundamental components of perceived value while drawing on theoretically

established dimensions that have demonstrated applicability across service contexts. This structure provides a theoretically grounded and parsimonious representation of perceived value suitable for the museum context.

Among the benefit dimensions, emotional benefits refer to the positive affective responses elicited during museum experiences, including enjoyment, pleasure, excitement, wonder, and well-being (Richins, 1997). Their theoretical foundation lies in experiential consumption theory, which positions emotions as a central component of value creation rather than a by-product of consumption (Hirschman & Holbrook, 1982). Complementary perspectives, including the Pleasure-Arousal-Dominance framework (Mehrabian & Russell, 1974) and Russell's (1980) circumplex model, further explain how emotional responses shape consumer evaluations, while Phillips and Baumgartner (2002) demonstrated that discrepancies between anticipated and experienced emotions directly influence satisfaction. Emotional benefits are commonly measured using the Consumption Emotions Set (CES), which was specifically developed to capture consumption-related emotions (Richins, 1997) and has subsequently been examined in other experiential contexts, demonstrating that context-specific adaptation is often required (Krohn, 2016). Consistent with these theoretical foundations, museum research demonstrates that positive emotions enhance visitor satisfaction and loyalty (Bigné et al., 2008) and contribute to more favourable evaluations of museum experiences, including exhibition attractiveness and uniqueness (Chang & Horng, 2010).

Social benefits reflect the value visitors derive from expressing identity, enhancing social self-concept, and strengthening interpersonal relationships through museum experiences. This dimension is grounded in the Theory of Consumption Values (Sheth et al., 1991), Social Identity Theory (Tajfel & Turner, 2004; Reed, 2002), and Signalling theory (Berger et al., 2011), which collectively emphasise that consumption generates value through both personal utility and social meaning. The social value dimension of the PERVAL scale remains the dominant approach for measuring this construct (Sweeney & Soutar, 2001), while previous research has distinguished it from related concepts such as status consumption (Eastman et al., 1999). In museum settings, visitors derive social value from social interaction, shared experiences, and strengthened interpersonal relationships (Taheri & Jafari, 2011). In contrast, active participation encourages post-visit engagement and recommendation behaviour (Antón et al., 2018). Moreover, museums represent socially visible cultural experiences that facilitate self-presentation and encourage communication about museum visits through interpersonal interactions and social media, thereby increasing their visibility among prospective visitors (Fu et al., 2024). The conspicuousness of cultural experiences has been theorised as a form of social signalling, in which the visibility of cultural consumption functions as a status cue (Bronner & de Hoog, 2021).

The sacrifice component of perceived value comprises both monetary and non-monetary costs. The monetary price reflects visitors' subjective evaluation of the financial sacrifice associated with a museum experience while also serving as a cue for service quality (Lichtenstein et al., 1993). Previous research demonstrates that monetary price influences perceived value through both quality and sacrifice evaluations (Teas & Agarwal, 2000) and represents an important determinant of willingness to pay (Sharifi-Tehrani et al., 2013), satisfaction, visit intention, and recommendation behaviour in museum settings (Putri & Tuti, 2024). As museums increasingly seek to balance financial sustainability with accessibility, visitors' perceptions of price fairness and value for money have become particularly important. Monetary price is therefore commonly measured through perceptions of price fairness, price reasonableness, value for money, and price-quality correspondence (Zeithaml, 1988; Dodds, 1995; Xia et al., 2004).

Non-monetary price extends the concept of sacrifice beyond financial expenditure to include time, physical and cognitive effort, inconvenience, accessibility, and opportunity

costs associated with museum experiences (Iglesias & Guillen, 2002). Theoretical support derives from perceived sacrifice theory, which conceptualises value as a trade-off between perceived benefits and perceived sacrifices (Agarwal & Teas, 2001) and opportunity cost theory, which recognises time and effort as valuable resources invested in consumption (Becker, 1965; Jacoby et al., 1976). Suri and Monroe (2003) further demonstrated that time constraints influence consumers' evaluations of both price and quality, while evidence from the zero-price effect indicates that non-monetary sacrifices remain relevant even when admission is free (Hüttel et al., 2018). Existing measurement frameworks, including SERV-PERVAL and GLOVAL, incorporate multiple dimensions relevant to perceived sacrifice and service evaluation, such as time investment, effort, accessibility, and convenience (Petrick, 2002; Roig et al., 2006). Empirical evidence suggests that consumers' value judgements are influenced not only by price itself but also by their broader perceptions of sacrifice associated with the purchase (Agarwal & Teas, 2001).

Overall, museum perceived value has evolved from a simple benefit–sacrifice evaluation to a complex, multidimensional construct that reflects diverse experiential benefits. While recent museum-specific scales provide increasingly comprehensive conceptualisations, their psychometric performance outside the original validation context remains largely unknown. Cross-cultural validation is therefore necessary before these instruments can be confidently applied in international museum research.

### *2.3. Relationship Between Museum Quality, Perceived Value, and Satisfaction*

Customer satisfaction is widely defined as a post-consumption evaluation arising from the comparison between consumers' expectations and their perceptions of actual performance. The seminal expectancy-disconfirmation framework conceptualises satisfaction as the outcome of confirming or disconfirming prior expectations, whereby performance exceeding expectations leads to satisfaction and performance falling short results in dissatisfaction (Oliver, 1980; Churchill & Surprenant, 1982).

The expectancy-disconfirmation paradigm remains the dominant theoretical foundation for satisfaction research, but subsequent studies have expanded its conceptual scope. Cadotte et al. (1987) demonstrated that consumers evaluate experiences against multiple comparison standards rather than prior expectations alone, while Anderson (1973) argued that excessively high expectations can result in less favourable evaluations when actual performance falls substantially short of expectations. Consequently, satisfaction occupies a central position in consumer behaviour research because it links service experiences with important behavioural outcomes, including loyalty, customer retention, and positive word-of-mouth communication (Nadiri & Gunay, 2013).

These theoretical developments have also shaped the measurement of satisfaction. Although both global and multidimensional reflective scales have been employed, contemporary research increasingly recognises satisfaction as a holistic evaluation integrating multiple aspects of the consumption experience. The SERVQUAL framework established the conceptual relationship between service quality and satisfaction (Parasuraman et al., 1988), while Caldwell (2002) argued that traditional museum visitor satisfaction questionnaires primarily reflect managers' perspectives and may therefore overlook the constructs that visitors themselves use when evaluating museum experiences. More recent museum research has therefore incorporated both cognitive and affective indicators of satisfaction. For example, Ab Rahman et al. (2024) assessed museum satisfaction using the educational, escapist, aesthetic, and entertainment dimensions of the Experience Economy framework (Pine & Gilmore, 1998), finding that the aesthetic dimension received the highest visitor evaluations, whereas the escapist dimension received the lowest.

Empirical evidence consistently identifies visitor satisfaction as a key outcome of museum experiences. Komarac et al. (2024) demonstrated that edutainment enhances perceived authenticity, thereby increasing visitor satisfaction. Similarly, visitor satisfaction has been shown to promote favourable destination evaluations, recommendations, and intentions to revisit, while socio-demographic characteristics appear to exert only limited influence on satisfaction (Badurina et al., 2025). Recent studies further indicate that multiple dimensions of the museum experience, including service management, the physical environment, exhibition-related experiences, and perceived value, jointly contribute to visitor satisfaction (Huo et al., 2024; Zhou & Ramli, 2025). Moreover, immersive and interactive exhibition experiences can further strengthen visitor satisfaction in technologically enhanced museum environments (Yang & Huang, 2025). Consistent with these findings, Radder and Han (2013) demonstrated that perceived museum quality positively influences visitor satisfaction, which subsequently enhances conative loyalty among museum visitors. Overall, satisfaction is closely intertwined with both museum quality and perceived value (Sitohang & Galihkusumah, 2026; So et al., 2025) and reflects visitors' holistic evaluation of their museum experiences by integrating cognitive, affective, sensory, and social responses rather than merely assessments of exhibition quality (Del Chiappa et al., 2014).

While satisfaction is not the focus of this study, it is one of the most frequently examined outcomes related to museum quality and perceived value. Therefore, it is important to assess how those constructs influence satisfaction by testing their nomological validity to ensure they are appropriately connected to satisfaction.

## 3. Materials and Methods

In this study, we follow the guidelines for validating the measurement scale recommended by Lim et al. (2026). The scale was validated across four separate studies. In this chapter, we briefly describe the materials and methods for each study. The results and further argumentations are provided in the chapter on the research results.

The first study focused on developing the measurement scales for museum quality and perceived value. Measurement items were conceptualised based on the literature review, self-generated or partially adapted from the existing literature, and then tailored to the museum context. Content validity was evaluated by a panel of seven experts using the Content Validity Index (CVI) and the modified kappa coefficient, confirming that the items adequately represented the proposed constructs.

The second study employed a quantitative pilot survey of visitors from two Slovenian museums. Data were collected through an online questionnaire using the 1KA Arnes Web platform. An Exploratory Factor Analysis (EFA) with Varimax rotation in IBM SPSS 30 was used to identify the underlying factor structure and eliminate poorly performing items. Internal consistency was assessed using Cronbach's alpha.

The third study validated the refined scales using a newly collected sample of museum visitors. Confirmatory Factor Analysis (CFA) was conducted with IBM SPSS 30 and IBM SPSS AMOS 27 software to verify the measurement model, while reliability, convergent validity, and discriminant validity were assessed using composite reliability (CR), average variance extracted (AVE), the Fornell–Larcker criterion, and the HTMT ratio of correlation. Common method bias was also examined using Harman's single-factor test and the common latent factor technique.

The fourth study assessed the nomological and predictive validity of the validated scales by testing the structural relationships between museum quality, perceived value, and visitor satisfaction. The theoretically expected relationships were examined within a structural model to determine whether the constructs behaved consistently with established theory.

## 4. Results

### 4.1. Study 1: Conceptualisation, Dimension Formation and Content Validity

#### 4.1.1. Conceptualisation of the Measurement Constructs

Museum quality refers to visitors' overall assessment of how successfully a museum delivers a high-quality experience. In this study, the construct is reflected through three dimensions: physical environment and experience, originality, and quality of personnel. The physical environment and experience describe visitors' evaluations of the museum's cleanliness, organisation, aesthetic appeal, and the overall pleasantness of the visit. Originality captures the extent to which the exhibition is perceived as distinctive and novel. At the same time, the quality of personnel reflects visitors' evaluation of staff competence, professionalism, responsiveness, trustworthiness, and willingness to help. Together, these dimensions represent the key aspects by which visitors evaluate a museum's quality.

On the other hand, the museum perceived value refers to visitors' overall evaluation of what they gain from it relative to what they give up. In the present study, perceived value is represented by four dimensions: emotional benefits, social benefits, monetary price, and non-monetary price. Emotional benefits capture the positive feelings generated by the museum visit, such as enjoyment, pleasure, and happiness. Social benefits reflect the value of sharing the experience with others and the positive image a museum visit may create. Monetary price relates to visitors' judgements of price fairness and value for money, whereas non-monetary price reflects the time and effort required to access the museum experience. Taken together, these dimensions capture the principal benefits and sacrifices that shape visitors' perceptions of museum value.

#### 4.1.2. Dimension Formation

To assess the quality and perceived value of the museum, we adopted items from established empirical tools in museum service quality, visitor experience, and general service research. When the existing items found in the literature did not sufficiently cover the full range of concepts relevant to the museum context, additional items were generated. These were developed based on the conceptual definitions of the respective constructs and were designed to complement the adapted items, ensuring adequate content coverage of the concepts. The self-generated items are indicated in Tables 1 and 2.

During the generation phase, we closely adhered to the construct's conceptualisations. In cases where no existing scales fully matched the research context, we modified individual dimensions and items as needed and combined them into a single measurement instrument. Accordingly, the resulting scales should be understood as integrated measurement instruments that combine newly developed and adapted items, rather than as direct adaptations of any single existing scale.

Items for measuring quality and personnel were adopted from Wu and Li (2017). These were used to measure various aspects of museum quality, including the condition of basic infrastructure (such as parking lots, restrooms, and catering services), the quality of exhibition content, the professionalism and responsiveness of staff, and the museum's physical environment. The latter encompasses aesthetic appeal, the pleasantness of the ambience, and the overall orderliness of the premises.

Items related to aspects of the physical environment, visitors' experiences, and guidance during their exploration have been self-generated. They highlight the importance of clearly presenting information and providing intuitive navigation, as these factors enable visitors to access information more efficiently and enhance their overall museum experience.

One item used to assess the exhibition's originality was partially adapted from Z. Li et al. (2021), and the other was self-generated. They emphasise the significance of perceived originality, uniqueness, and creativity in the museum's offerings. These char-

acteristics play a crucial role in setting the museum apart from other cultural institutions, enhancing both the attractiveness and memorability of the visitor experience.

Items to measure the museum's perceived value were developed from established measurement instruments in the fields of perceived service value, consumer experience, and consumer behaviour. Those items were mainly used in contexts outside of museum research. According to our conceptualisation, items were included to assess the emotional, functional, economic, and social value of the museum experience. Each item was adapted to fit the specific context of the museum being studied.

The items used to measure emotional benefits were adapted from the PERVAL scale (Sweeney & Soutar, 2001; Petrick, 2002), which assesses the perceived value of products and services. From this instrument, items were selected that assess the positive emotions visitors experience during their museum visit, including well-being, enjoyment, joy, satisfaction, happiness, and relaxation. The items were adapted to suit the museum context.

The items used to measure social benefits were partly adopted from Z. Li et al. (2021) and Xie (2024), including one self-generated item. These assess various aspects, including the sense of belonging among museum visitors, opportunities for social interaction, and the perceived social reputation an individual gains from visiting the museum. Additionally, the ranking includes an item that measures a visitor's willingness to share their experience with family and friends after their museum visit. This willingness is an important indicator of positive perceived value and future behavioural intentions following the visit.

The items for measuring monetary and non-monetary prices were adopted from those developed by Sweeney and Soutar (2001) and Petrick (2002). An additional two were self-generated. This dimension includes perceptions of a reasonable ticket price, the feeling that a visit to the museum is worth the money invested, and an overall assessment of value for money. Perceived economic value is an important factor in shaping visitor satisfaction and willingness to return.

All items were initially tailored to the context of museum research, as previous studies were also related to other service categories, such as galleries, cultural events, or categories outside the museum context. In the adaptation process, special care was taken to maintain the original meaning of the statements, particularly when adopting items and aligning them with the Slovenian cultural and research environment. Some expressions were further refined to suit the specific context of the museum in question, while still preserving the conceptual meaning of each dimension and the original measurement tools.

#### 4.1.3. Content Validity

The content validity of the scale was evaluated using the Content Validity Index (CVI), which is a commonly used method for systematically assessing the adequacy of measurement items (Lynn, 1986; Polit & Beck, 2006; Yusoff, 2019). A panel of seven experts, with expertise in consumer behaviour, marketing, tourism, and the museum context, was recruited to assess the content validity of the proposed items. The panel consisted of two psychology academics specialising in consumer behaviour, two marketing academics with expertise in services marketing and marketing research, and two tourism academics experienced in tourism and visitor research. The seventh member was a museum professional with extensive practical knowledge of the museum context. Three panel members had prior experience in museum-related research, providing valuable domain-specific expertise. Together, the panel brought theoretical, methodological, and practical insights relevant to evaluating the content validity of the proposed items.

A team of experts independently assessed the relevance of each item on a 4-point scale (1 = "not relevant" to 4 = "very relevant"), using an assessment form that included the construct's definition and clear instructions for assessing each item.

Based on the collected estimates, we calculated the item-level content validity index (I-CVI) and the overall-scale content validity index (S-CVI). The S-CVI was expressed in two ways: as the average of all I-CVI values (S-CVI/Ave) and as the proportion of items that achieved universal consensus among experts (S-CVI/UA). Additionally, we used the modified kappa coefficient (κ*), which adjusts for chance, to assess the quality and perceived value scales. In line with the literature, I-CVI $\geq$ 0.78 and S-CVI/Ave $\geq$ 0.90 were considered appropriate (Polit et al., 2007; J. Shi et al., 2012).

Concerning the Museum quality scale, I-CVI values ranged from 0.714 to 1.000. Specifically, seven items achieved complete agreement among all experts (I-CVI = 1.000), ten items achieved an I-CVI of 0.857, and one item had an I-CVI of 0.714. At the scale level, the S-CVI/Ave was 0.905, exceeding the commonly recommended threshold of 0.90 and indicating excellent overall content validity. The modified kappa coefficients ranged from 0.658 to 1.000, with seven items achieving κ* = 1.000, ten items achieving κ* = 0.849, and one item achieving κ* = 0.658. The average modified kappa coefficient across all items was 0.914. Overall, these findings indicate strong expert agreement and provide substantial evidence for the measurement scale's content validity.

For the museum perceived value scale, the I-CVI values ranged from 0.857 to 1.000. Specifically, four items achieved complete agreement among all experts (I-CVI = 1.000), while nine items achieved an I-CVI of 0.857. At the scale level, the S-CVI/Ave was 0.901, exceeding the commonly recommended threshold of 0.90 and indicating excellent overall content validity. The modified kappa coefficients ranged from 0.849 to 1.000, with an average modified kappa coefficient of 0.896 across all items. Overall, these findings indicate strong expert agreement and provide strong evidence for the measurement scale's content validity.

### *4.2. Study 2: Scale Purification*

#### 4.2.1. Data Collection and Sample Characteristics

Study 2 was implemented for initial scale purifications. A questionnaire based on items generated in Study 1 was developed to measure the museum's quality and perceived value. For Studies 2 and 3, we used a non-random sample of visitors to two Slovenian museums.

Data collection took place on-site at two museums in Ljubljana, Slovenia, coinciding with temporary specialised exhibitions. These temporary exhibitions were chosen as the setting for data collection because they attracted a relatively large number of visitors during a specific timeframe, facilitating data collection while ensuring consistency in responses. Importantly, visitors attending these temporary exhibitions also had access to the museums' permanent exhibitions and other offerings. As a result, respondents could engage with the museum more comprehensively, allowing them to provide an overall evaluation of their visit rather than a limited assessment focused solely on the temporary exhibition.

For Study 2, data were collected at the Slovene Ethnographic Museum, Slovenia's central ethnological museum in Ljubljana, Slovenia. This museum focuses on both the material and intangible cultural heritage of Slovenia and other cultures. It features a variety of exhibitions, both permanent and temporary, that explore everyday life, cultural identities, traditions, and cultural practices.

Visitors to the respective temporary exhibitions were approached on-site and invited to participate in this study. They were able to access the questionnaire electronically by scanning a QR code that linked to it within the 1KA Arnes system at the exhibition site. They were encouraged to complete the questionnaire on-site, but they were also given the option to do it later.

A non-probability sampling approach was used because the primary objective was to validate a measurement scale rather than to estimate population parameters or generalise descriptive statistics to the entire population. In this kind of research, the suitability of the

sample depends primarily on its relevance to the target population and its adequacy for conducting multivariate analyses, rather than on random selection (Hinkin, 1998; DeVellis & Thorpe, 2021). However, in Section 5.4, we acknowledge some limitations of the non-random sampling design.

The final sample for Study 1 consisted of 49 respondents. The sample was predominantly female (65.3%), with male respondents accounting for 34.7%. Most respondents were between 18 and 30 years of age (75.5%), followed by those aged 51–70 (12.2%), 31–50 (10.2%), and 71 years or older (2.0%). The sample was relatively highly educated: 44.9% of respondents held a graduate degree, 22.4% held a master's degree, 18.4% had completed higher vocational education, 10.2% had completed secondary education, and 4.1% held a doctoral degree. On average, respondents reported visiting museums 4.38 times per year.

#### 4.2.2. Validity and Reliability Testing

Data were analysed using explanatory factor analysis (EFA) to identify the underlying factor structure of the scale (Watkins, 2018). EFA allowed us to test how individual elements relate to common factors while remaining distinct from other factors, thereby assessing whether the dimensions proposed in Study 1 fit the data. In the factor analysis, we used principal component analysis with Varimax rotation. An EFA was conducted on a small test sample of 49 respondents. The results are presented in Tables 1 and 2.

The first EFA was conducted to identify the latent dimensions underlying visitors' perceptions of the museum quality. The adequacy of the data was supported by a Kaiser–Meyer–Olkin (KMO) coefficient of 0.774. The analysis yielded a three-factor solution that explained a substantial share of the total variance (TVE = 68.53%). From the initial 18 items, we retained 14. Four were excluded due to low factor loadings on the main factor or cross-loadings across several factors.

The first factor, Quality of Personnel, showed strong loadings ranging from 0.665 to 0.837 and reflected staff professionalism, friendliness, availability, and problem-solving orientation; internal consistency for this factor was high ($\alpha = 0.895$). The second factor, Physical Environment and Experience, captured evaluations of cleanliness, aesthetics, spatial organisation, and the overall pleasantness of the visit, with loadings ranging from 0.674 to 0.874 and good reliability ($\alpha = 0.858$). The third factor, Originality, comprised perceptions of the museum's uniqueness and originality, with high loadings (0.814–0.922) and satisfactory internal consistency ($\alpha = 0.854$). Overall, the factor loadings were substantial and clearly associated with their respective constructs, indicating a stable, interpretable factor structure with adequate explained variance and reliability, suitable for subsequent analyses.

**Table 1.** EFA results for the museum quality scale.

| Items | Quality of Personnel | Physical Environment and Experience | Originality | Cronbach's Alpha |
|---|---|---|---|---|
| When a visitor has a problem, the service personnel show a sincere interest in solving it. | 0.837 | | | 0.895 |
| The attitude of service personnel demonstrates their willingness to help me. | 0.812 | | | |
| The behaviour of service personnel gives me trust. | 0.792 | | | |
| I can count on the personnel professional knowledge of this museum. | 0.780 | 0.331 | | |
| The personnel are never too busy to respond to visitors' requests. | 0.711 | | | |
| I can count on the personnel being friendly. | 0.690 | | | |

**Table 1.** *Cont.*

| Items | Quality of Personnel | Physical Environment and Experience | Originality | Cronbach's Alpha |
|---|---|---|---|---|
| The personnel of this museum are competent. | 0.665 | 0.429 | | 0.858 |
| The facilities of this museum are clean and well maintained. * | | 0.874 | | |
| I appreciate the style inside of this museum. * | | 0.776 | | |
| The museum's services are clearly organized and everything is easy to understand. * | | 0.766 | | |
| This museum is aesthetically attractive. | | 0.732 | | |
| Visiting this museum is a pleasant experience. | | 0.674 | | |
| I think this exhibition is unique. | | | 0.922 | 0.854 |
| I think this exhibition is original. * | | | 0.814 | |

KMO = 0.774; TVE = 68.53; factor loadings lower than 0.40 are not displayed; *—self-generated items by the authors.

**Table 2.** EFA results for the museum perceived value scale.

| Items | Emotional Benefits | Social Benefits | Monetary Price | Non-Monetary Price | Cronbach's Alpha |
|---|---|---|---|---|---|
| Visiting this museum gives me a sense of joy. | 0.908 | | | | 0.896 |
| Visiting this museum makes me feel good. | 0.861 | | | | |
| Visiting this museum makes me feel delighted. | 0.848 | | | | |
| Visiting this museum gives me pleasure. | 0.772 | | | | |
| Visiting this museum gives me happiness. | 0.758 | | | | |
| Visiting this museum can help me win more praise on social media. * | | 0.898 | | | 0.873 |
| After the exhibition I couldn't wait to share my experience with my family and friends. | | 0.892 | | | |
| Visiting this museum would make a good impression on other people. | | 0.850 | | | |
| Visiting this museum is worth the money. | | | 0.873 | | 0.854 |
| Visiting this museum is reasonably priced. * | | | 0.847 | | |
| Visiting this museum is a good buy. | | | 0.825 | | |
| Buying tickets for this museum required little effort. | | | | 0.925 | 0.850 |
| Buying tickets for this museum required little time. * | | | | 0.895 | |

KMO = 0.675; TVE = 78.73; factor loadings lower than 0.40 are not displayed; *—self-generated items by the authors.

The second EFA was conducted to assess the dimensionality of visitors' evaluations of the museum's perceived value. Sampling adequacy was acceptable (KMO = 0.675), supporting the suitability of the data for factor analysis. The extracted four-factor solution accounted for a high proportion of the total variance (TVE = 78.73%). From the initial 14 items, one was excluded due to low factor loading. Factor loadings were strong and clearly defined, ranging from 0.758 to 0.908 for Emotional Benefits, 0.850 to 0.898 for Social Benefits, 0.825 to 0.873 for Monetary Price, and 0.895 to 0.925 for Non-Monetary Price factors. Internal consistency was satisfactory to high across all factors, with Cronbach's alpha coefficients of 0.896, 0.873, 0.854, and 0.850, respectively. Overall, the results indicate

a robust and interpretable factor structure with strong loadings, high explained variance, and good reliability.

Although the sample size for the EFA was modest (N = 49), the data's factorability was supported by several empirical indicators. The sample adequacy was acceptable for both scales, and all item communalities exceeded the 0.50 threshold. The extracted factors accounted for more than 70% of the variance. Additionally, the primary factor loadings were generally strong, in most cases much higher than 0.6, and cross-loadings only in one case exceeded the threshold of 0.4. Also, in both cases, KMO coefficients exceeded the suggested threshold of 0.6. These findings enhance the interpretability of the exploratory factor solutions, even though the limited sample size remains a limitation. (MacCallum et al., 1999; de Winter et al., 2009).

### *4.3. Study 3: Scale Refinement*

#### 4.3.1. Data Collection and Sample Characteristics

For Study 3, data were collected at the National Museum of Slovenia, which is also located in Ljubljana, Slovenia. Established in 1821, it is the oldest museum institution in the country and boasts extensive collections of Slovenian cultural heritage, particularly in archaeology and history, spanning various periods of Slovenia's past. Data collection followed the same protocol as in Study 2.

The final sample for Study 3 included 104 respondents. Most participants were female (68.3%), while male respondents comprised 30.8%, and 1.0% identified as other. Most respondents were aged 18–30 years (84.6%), followed by those aged 31–50 years (7.7%), 51–70 years (6.7%), and 71 years or older (1.0%). The sample was relatively well-educated: 34.6% held a graduate degree, 26.9% had completed higher vocational education, 18.3% held a master's degree, 15.4% had completed secondary education, and 4.8% held a doctoral degree. On average, respondents reported visiting museums 3.69 times per year.

#### 4.3.2. Validity and Reliability Testing

After scale purification in Study 2, we performed a confirmatory factor analysis (CFA) using a new sample to refine the scale and validate its dimensionality under more stringent scrutiny. The data were collected using the same methodology as described in Study 2. This time, data were collected from a new sample of 104 respondents, since, according to Lim et al. (2026), scale refinement should be performed on a separate sample from scale purification.

As a next step, confirmatory factor analyses (CFA) were conducted using IBM SPSS 30 and AMOS 27. The results are presented in Table 3.

**Table 3.** CFA results for the museum quality scale with item means, standard deviations, CR and AVE values.

| Items | Mean | Std. Deviation | Lambda Coefficient | CR | AVE |
|---|---|---|---|---|---|
| **Physical Environment and Experience** | | | | | |
| The museum's facilities are clean and well-maintained. | 4.20 | 0.688 | 0.838 | 0.833 | 0.557 |
| I appreciate the style inside this museum. | 4.05 | 0.702 | 0.779 | | |
| This museum is aesthetically attractive. | 4.00 | 0.724 | 0.686 | | |
| Visiting this museum is a pleasant experience. | 4.22 | 0.590 | 0.669 | | |

**Table 3.** *Cont.*

| Items | Mean | Std. Deviation | Lambda Coefficient | CR | AVE |
|---|---|---|---|---|---|
| **Originality** | | | | | |
| I think this exhibition is novel. | 3.97 | 0.818 | 0.862 | 0.831 | 0.710 |
| I think this exhibition is original. | 3.90 | 0.865 | 0.824 | | |
| **Quality of personnel** | | | | | |
| When a visitor has a problem, service personnel show sincere interest in resolving it. | 3.69 | 0.764 | 0.670 | 0.873 | 0.536 |
| The attitude of service personnel demonstrates their willingness to help me. | 3.84 | 0.670 | 0.799 | | |
| The behaviour of service personnel gives me trust. | 3.81 | 0.624 | 0.777 | | |
| I can count on the personnel's professional knowledge of this museum. | 3.89 | 0.637 | 0.775 | | |
| The personnel are never too busy to respond to visitors' requests. | 3.59 | 0.719 | 0.693 | | |
| I can count on the personnel being friendly. | 3.89 | 0.652 | 0.667 | | |

$\chi^2(51) = 81.694$; IFI = 0.947; TLI = 0.929; CFI = 0.945; RMSEA = 0.076.

Model fit indices indicated an acceptable fit: $\chi^2(51) = 81.694$; IFI = 0.947; TLI = 0.929; CFI = 0.945, and RMSEA = 0.076. The overall fit is considered acceptable according to established guidelines (e.g., Byrne, 1994; Hu & Bentler, 1999), with RMSEA < 0.08, TLI > 0.90, CFI > 0.90, and IFI > 0.90.

Following the CFA results evaluating the measurement model for the museum quality scale indicator, loadings ranged from 0.667 to 0.872. Composite reliabilities (CR) exceeded the suggested threshold, ranging from 0.821 to 0.862, and the average variance extracted (AVE) values ranged from 0.536 to 0.710, indicating adequate convergent validity. Two items were excluded after the modification indices showed a significantly better fit.

Discriminant validity was assessed using both the Fornell and Larcker (1981) criterion and the HTMT ratio (Table 4). The Fornell–Larcker test confirmed that the square roots of AVE for all constructs exceeded the correlations between constructs. Additionally, the HTMT (Henseler et al., 2015) values were all below the recommended threshold of 0.85, further supporting discriminant validity (Table 5).

**Table 4.** Correlations between latent variables and square roots of AVE for the museum quality scale.

| | 1 | 2 | 3 |
|---|---|---|---|
| 1. Physical Environment and Experience | **0.746** | | |
| 2. Originality | 0.615 | **0.843** | |
| 3. Quality of personnel | 0.388 | 0.501 | **0.732** |

All correlations were significant at $p < 0.001$. Bolded values indicate the Square Roots of Ave.

**Table 5.** Heterotrait–Monotrait Ratio of Correlations (HTMT) for the museum quality scale.

| | 1 | 2 |
|---|---|---|
| 1. Physical Environment and Experience | | |
| 2. Originality | 0.658 | |
| 3. Quality of personnel | 0.434 | 0.511 |

Overall, these results indicate that the model demonstrates adequate convergent and discriminant validity for the latent constructs of physical environment and experience, originality, and quality of personnel. The final museum quality scale is presented in Appendix A in Table A1.

CFA results for the museum perceived value scale are presented in Table 6. For the museum perceived value, one indicator was excluded from the analysis based on modification indices, a change that significantly improved the model fit. The constructs were initially tested as single-construct models, followed by a multi-construct model with four latent variables. The latter model showed a better fit and was retained. The overall model fit indices indicated a good fit of the structural model: $\chi^2(48) = 64.69$ ($p > 0.05$), IFI = 0.973, TLI = 0.961, CFI = 0.972, and RMSEA = 0.058, all of which meet the recommended thresholds in the literature.

**Table 6.** CFA results for the museum perceived value scale with item means, standard deviations, CR and AVE values.

| Items | Mean | Std. Deviation | Lambda Coefficient | CR | AVE |
|---|---|---|---|---|---|
| **Emotional Benefits** | | | | | |
| Visiting this museum gives me a sense of joy | 3.89 | 0.858 | 0.864 | 0.874 | 0.637 |
| Visiting this museum gives me pleasure. | 4.06 | 0.680 | 0.860 | | |
| Visiting this museum makes me feel good. | 4.18 | 0.587 | 0.675 | | |
| Visiting this museum gives me happiness. | 3.77 | 0.803 | 0.778 | | |
| **Social Benefits** | | | | | |
| After the exhibition, I couldn't wait to share my experience with my family and friends. | 3.42 | 0.982 | 0.867 | 0.849 | 0.653 |
| Visiting this museum can help me win more praise on social media. | 3.22 | 1.106 | 0.825 | | |
| Visiting this museum would make a good impression on other people. | 3.25 | 0.911 | 0.725 | | |
| **Monetary Price** | | | | | |
| Visiting this museum is worth the money. | 3.94 | 0.761 | 0.889 | 0.855 | 0.666 |
| Visiting this museum is a good buy. | 3.95 | 0.729 | 0.853 | | |
| Visiting this museum is reasonably priced. | 3.76 | 0.830 | 0.692 | | |
| **Non-monetary price** | | | | | |
| Buying tickets for this museum required little effort. | 3.74 | 1.182 | 0.701 | 0.728 | 0.573 |
| Buying tickets for this museum required little time. | 3.90 | 1.019 | 0.809 | | |

Fit indices: $\chi^2(48) = 64.89$; IFI = 0.973; TLI = 0.961; CFI = 0.972; RMSEA = 0.058.

The CFA results indicate that all indicator loadings, except one, exceeded the recommended threshold of 0.6, ranging from 0.675 to 0.889. Composite reliabilities (CR) ranged from 0.728 to 0.874, indicating satisfactory internal consistency. Average variance extracted (AVE) values ranged from 0.573 to 0.666, demonstrating acceptable convergent validity.

To assess discriminant validity, the Fornell–Larcker criterion was applied. Table 7 shows that the square roots of the AVEs for all constructs exceed the correlations among the constructs, confirming discriminant validity. Additionally, the HTMT analysis (Henseler et al., 2015) further supported discriminant validity (Table 8), as all inter-construct correlation ratios were below the recommended threshold of 0.85.

**Table 7.** Correlations between latent variables and square roots of AVE for the museum perceived value scale.

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. Emotional Benefits | **0.798** | | | |
| 2. Social Benefits | 0.377 | **0.808** | | |
| 3. Monetary Price | 0.644 | 0.458 | **0.816** | |
| 4. Non-monetary Price | 0.207 | −0.041 | 0.227 | **0.757** |

All correlations were significant at $p < 0.001$. Bolded values indicate the Square Roots of Ave.

**Table 8.** Heterotrait–Monotrait Ratio of Correlations (HTMT) for the museum perceived value scale.

| | 1 | 2 | 3 |
|---|---|---|---|
| 1. Emotional Benefits | | | |
| 2. Social Benefits | 0.369 | | |
| 3. Monetary Price | 0.648 | 0.413 | |
| 4. Non-monetary Price | 0.224 | 0.030 | 0.248 |

Overall, these results suggest that the structural model demonstrates good fit and adequate convergent and discriminant validity for the latent constructs: emotional benefits, social benefits, monetary price, and non-monetary price. The final museum perceived value scale is presented in Appendix A in Table A2.

Additionally, a Monte Carlo sensitivity analysis was conducted to assess the implications of the small sample size for confirmatory factor analysis (CFA) (N = 104). This analysis used the parameter estimates from the empirical CFA models as population values (Muthén & Muthén, 2002).

For the three-factor museum quality model, the simulation demonstrated high power across all factor loadings and latent factor correlations ($\geq$0.968), indicating generally low parameter bias and acceptable coverage. For the four-factor perceived museum value model, power remained high for all factor loadings ($\geq$0.962) but was lower for several small latent factor correlations. These findings imply that while the sample size was adequate for estimating the measurement parameters crucial to the CFA—particularly the factor loadings—it was less effective in detecting small associations among latent factors in the more complex model. Therefore, the modest CFA sample size may present a limitation, and replication in a larger independent sample is recommended.

#### 4.3.3. Common Method Bias

To minimise the risk of common method bias, several procedural remedies were implemented before data collection, including enhancing the questionnaire design with clear, concise item wording and ensuring respondent anonymity. To reduce potential response

bias and order effects, the order of questionnaire items was randomised across respondents, such that items measuring the same construct were not systematically presented together.

Additionally, the possibility of common-method bias was assessed using the Harman one-factor test and the common latent factor technique. For the museum quality scale analysis, the primary factor explained 44.1% of the total variance, and for the museum perceived value scale, 34.60%, falling short of the 50% threshold. This suggests that no single dominant factor accounts for most of the variance.

Furthermore, we employed the common latent factor (CLF) technique (Collier, 2020). A chi-square difference test between the baseline and CLF models for the museum quality scale was significant ($\Delta\chi^2(1) = 23.27$, $p < 0.001$), suggesting the possibility of common method bias. In contrast, a chi-square difference test between the baseline and CLF models for the museum perceived value scale was not significant ($\Delta\chi^2(1) = 1.697$, $p = 0.193$), indicating no common method bias.

### *4.4. Study 4: Nomological Validity Testing*

In the final study, we evaluated the performance of our measurement scale by placing the construct within a broader theoretical framework. This approach allows us to determine whether the empirical constructs we developed are related to other constructs, in line with established theory and prior research. Consequently, we could assess both its nomological and predictive validity (Lim, 2024).

In Study 4, we used the same sample as in Study 3. While we acknowledge some limitations (which we discuss in the Section 5.4), this approach allowed us to examine the empirical relationships among museum quality, perceived value, and visitor satisfaction. We focused on visitor satisfaction to assess nomological validity, as perceived quality is widely recognised as a factor influencing customer satisfaction. Additionally, perceived value also contributes to determining customer satisfaction. It refers to consumers' overall assessment of the benefits they receive compared to the costs or sacrifices they make to acquire and use a product or service (Zeithaml, 1988). Conceptual justifications for these relationships were provided in the chapter discussing the relationships between the quality and perceived value of museum services and visitor satisfaction.

To assess nomological validity, a structural model was tested in which museum quality and museum perceived value were directly related to visitor satisfaction. Composite scores were calculated for the first-order dimensions of museum quality and museum perceived value and used as manifest indicators of the respective second-order latent constructs. Specifically, museum quality was specified as a second-order latent construct represented by three manifest indicators (physical environment and experience, originality, and quality of personnel), while museum perceived value was specified as a second-order latent construct represented by four manifest indicators (emotional benefits, social benefits, monetary price, and non-monetary price). Satisfaction was measured using three indicators on a five-point Likert scale.

In this initial structural model, both museum quality and perceived value were identified as direct predictors of visitor satisfaction. While the relationships for both predictors were positive and statistically significant, the overall model showed inadequate fit: $\chi^2(32) = 105.994$ ($p < 0.001$), $\chi^2/\mathrm{df} = 3.312$, IFI = 0.859, TLI = 0.797, CFI = 0.856, and RMSEA = 0.150. Upon examining the modification indices, a strong and theoretically meaningful connection was suggested between museum quality and perceived value (MI = 27.258). Since perceived quality is theoretically expected to influence the formation of perceived value, a path from museum quality to perceived value was incorporated into the structural model.

The revised model showed a substantial improvement in fit: $\chi^2(31) = 68.150$ ($p < 0.001$), $\chi^2/df = 2.198$, IFI = 0.930, TLI = 0.895, CFI = 0.928, and RMSEA = 0.108. While the RMSEA exceeded conventional thresholds, this index should be interpreted with caution, given the relatively small sample size (N = 104). Simulation research has shown that sample RMSEA estimates may be upwardly biased and TLI downwardly biased in smaller samples and that the performance of fit indices depends on sample size, model size, factor loadings, and their interactions (D. Shi et al., 2019). Accordingly, model fit was evaluated by considering the overall pattern of fit indices rather than relying on a single cutoff criterion.

In the revised model, museum quality was positively and significantly related to museum perceived value ($\beta = 0.675$, $p < 0.001$), and museum perceived value was positively and significantly related to visitor satisfaction ($\beta = 0.838$, $p < 0.001$). After accounting for perceived value, the direct effect of museum quality on visitor satisfaction was no longer statistically significant ($\beta = 0.153$, $p = 0.166$). However, museum quality had a statistically significant indirect effect on visitor satisfaction through museum perceived value ($\beta = 0.565$, 90% bias-corrected bootstrap CI [0.365, 0.856], $p < 0.01$). These results suggest that the relationship between museum quality and visitor satisfaction operates primarily through perceived value and provide support for the nomological validity of the proposed measures.

## 5. Discussion

The main goal of this study was to develop and validate a measurement instrument to assess museum quality and perceived value. Following established guidelines for scale development and validation, we analysed the factorial structure, reliability, and construct validity of both instruments across four studies. The findings indicate that both scales exhibit strong psychometric properties. The final museum quality scale maintained a coherent three-dimensional structure, whereas the museum perceived value scale exhibited a stable four-dimensional structure. Overall, these results suggest that the refined instruments provide reliable and valid measures of visitors' evaluations of museums.

### *5.1. Psychometric Properties of the Developed Scales*

The psychometric evaluation consistently supported the multidimensional structure of both instruments. Both exploratory and confirmatory factor analyses confirmed the proposed dimensions of museum quality and perceived value, indicating that visitors differentiate among several complementary aspects of their museum experiences rather than forming a single overall evaluation. This finding reinforces the understanding of museum experiences as complex phenomena, in which visitors simultaneously assess the exhibition environment, staff interactions, originality, emotional responses, social benefits, and perceived sacrifices.

The retained dimensions demonstrated satisfactory internal consistency, composite reliability, convergent validity, and discriminant validity, indicating that the constructs were measured both reliably and distinctly. The sequential process of refining the items through exploratory and confirmatory factor analyses improved the instruments' psychometric performance. This process involved eliminating items with weak factor loadings or cross-loadings, while still maintaining the original constructs' conceptual coverage. As a result, the final scales achieved a balance between measurement accuracy and practical usability, providing concise instruments that minimise respondent burden without compromising reliability or validity. Overall, these findings suggest that both developed scales, which integrate newly developed and adapted items, are robust measurement tools suitable for future research and for evaluating museum visitors' experiences in practice.

### 5.2. Contextualization with Previous Literature

The validated factor structures are largely consistent with previous theoretical and empirical research, confirming that both the quality and perceived value of museums are multidimensional constructs. Regarding the museum's quality, the identified dimensions closely align with museum-specific frameworks that distinguish among the physical environment, staff interactions, and exhibition characteristics. Notably, the identification of "Physical Environment" and "Quality of Personnel" corresponds with earlier adaptations of SERVQUAL, HISTOQUAL, and MUSEQUAL models. Additionally, the emergence of "Originality" as a distinct dimension reinforces recent research that emphasises the experiential and exhibition-focused nature of museum visits.

The four-dimensional structure of perceived value in the museum aligns with the multidimensional concepts outlined in PERVAL and SERV-PERVAL. The dimensions identified indicate that visitors assess their museum experiences based on a mix of emotional, social, monetary, and non-monetary factors. This supports the benefits–sacrifices perspective of perceived value.

Our research not only confirms previous findings but also expands the existing literature in several important ways. Unlike past validation studies, which typically examined museum quality and perceived value separately, this research validates both constructs simultaneously using a unified methodological framework. The museum quality scale includes originality as a core dimension, highlighting the growing importance of unique exhibition experiences in contemporary museums.

Additionally, the perceived value scale combines the established benefit and sacrifice dimensions into a concise instrument tailored specifically for museums. This is important because perceived value is inherently a trade-off between benefits and sacrifices, and integrating both dimensions into a single instrument provides a more comprehensive assessment of visitors' value perceptions. Previous museum-specific perceived value scales did not simultaneously incorporate both benefit and sacrifice dimensions, whereas the proposed instrument provides a more comprehensive assessment of visitors' perceived value. By integrating the benefit and sacrifice dimensions into a single instrument, the scale captures the multidimensional nature of perceived value while simplifying measurement and improving applicability in museum research.

Finally, this study offers one of the first comprehensive psychometric validations of both constructs in the Slovenian museum context, providing evidence of their applicability and laying the foundation for future validation in other cultural settings.

### 5.3. Implications for Research and Practice

The validated instruments provide a strong methodological foundation for future museum research, enabling reliable assessments of museum quality and perceived value in the Slovenian museum context. They also provide a consistent measurement framework that can support future validation studies and, once measurement equivalence has been established, comparisons across museums, visitor demographics, and cultural contexts. Since both constructs were validated simultaneously within a cohesive methodological framework, future studies can explore the relationships among museum quality, perceived value, visitor satisfaction, loyalty, intentions to revisit, recommendation behaviour, and other behavioural outcomes using instruments that are conceptually aligned and psychometrically robust. The complete final versions of both validated scales, including their dimensions and retained measurement items, are presented in Appendix A.

From a practical standpoint, validated tools provide museum managers with effective diagnostic instruments for systematically assessing visitors' evaluations of museums. Instead of relying solely on overall satisfaction scores, managers can pinpoint strengths

and weaknesses across specific areas, such as the physical environment, staff performance, exhibition originality, and the emotional and social benefits to visitors. They can also gauge visitors' perceptions of both monetary and non-monetary sacrifices. This information can guide evidence-based decisions regarding exhibition design, interpretation strategies, staff training, pricing policies, visitor flow management, and resource allocation.

The validated scales can serve as benchmarking tools for comparing visitor evaluations across exhibitions, museums, or time periods. For this purpose, museum managers can administer the same scales across different exhibitions or museums and compare mean scores for individual dimensions of museum quality and perceived value. Such comparisons help identify areas where an exhibition or museum performs relatively well or poorly and highlight specific aspects that may require managerial attention. Repeated administration can further enable managers to track changes in these scores over time and assess whether improvements in exhibition design, visitor services, or other strategic initiatives are reflected in visitors' evaluations. Their concise format makes them ideal for routine visitor surveys and ongoing quality monitoring while minimising the burden on respondents. Ultimately, these instruments foster a more visitor-centred approach to museum management by providing reliable evidence to enhance visitor experiences and strengthen museums' competitiveness in an increasingly experience-driven cultural environment.

### *5.4. Limitations and Future Directions*

Several limitations should be considered. First, this study relied on nonprobability sampling of visitors to two Slovenian museums. Although appropriate for psychometric validation, the sample characteristics may have influenced the observed psychometric results, as selection effects and sample homogeneity can affect item variance, inter-item correlations, factor loadings, and estimates of reliability and validity. Thus, the present findings provide initial support for the scales' psychometric properties, but their stability and generalizability across different populations and contexts cannot be assumed. Future research should therefore examine the scales with larger, more heterogeneous samples across different museum types and cultural settings. In particular, the present study does not establish whether the identified factor structures and psychometric properties are equivalent across specific museum categories, such as art, science, or historical museums. As visitor experiences and evaluations may vary by museum type (P. Li, 2024), further validation and measurement invariance testing across museum categories are needed before assuming that the scales perform equivalently across these settings. Also, the cross-sectional design does not permit evaluation of the instruments' temporal stability. Future studies should therefore assess test–retest reliability and longitudinal stability.

All variables were measured using self-report questionnaires in a cross-sectional study, which introduced the possibility of common method variance. Although Harman's single-factor test did not indicate substantial common method bias, the common latent factor analysis suggested potential common method variance for the museum quality scale. The significant difference between the baseline and CLF models for museum exhibition quality warrants caution when interpreting their nomological relationships. Shared method variance may partly contribute to the observed associations with other constructs, potentially inflating or biasing structural relationships. Future applications of the scale should therefore employ additional procedural remedies to minimise common method variance. Where feasible, museum exhibition quality and its antecedents or outcomes should be measured at different time points. Self-reported evaluations of museum exhibition quality and perceived value could be combined with temporally separated measures of satisfaction and behaviour. Researchers should also ensure clear, neutral item wording, respondent anonymity, and a statistical assessment of common method variance in subsequent validation studies.

The third significant limitation of this study is the relatively small sample size in both EFA and CFA. Smaller sample sizes can diminish the stability of factor solutions, increase variability in parameter estimates, and restrict the accuracy and generalizability of findings. Regarding the EFA, although the observed communalities, factor loadings, and measures of sampling adequacy supported the interpretability of the extracted factor solutions, these characteristics do not eliminate the uncertainty inherent in factor analysis in small samples.

The Monte Carlo sensitivity analysis for CFA indicated high statistical power for key measurement parameters, especially factor weights. It is, however, important to note that this analysis relies on parameters estimated from the empirical sample used. Therefore, the results should be interpreted with caution. Such analysis is conditional on the observed parameter values and does not provide an independent demonstration of sample-size adequacy. The results should therefore be regarded as supplementary evidence of sensitivity rather than confirmation that the sample size was sufficient.

Fourth, the current research focused on developing and initially validating scales but did not include a stage to assess generalizability. Nomological validity was tested using the same sample employed for the confirmatory factor analysis (CFA), which limits the independence of the validation evidence and highlights the need for cross-validation in an independent sample. Another limitation pertains to the fit of the structural model used to assess nomological validity. While most incremental fit indices indicated acceptable or nearly acceptable fit, the RMSEA exceeded conventional thresholds. Consequently, the evidence regarding nomological validity should be regarded as preliminary and requires further examination in larger, independent samples.

Therefore, future studies should cross-validate these scales using larger, probability-based samples that are more diverse across demographic groups, regions, museum types, and cultural contexts. This will help evaluate the stability of the factor structure, reliability, and various forms of validity, including convergent, discriminant, nomological, and predictive validity, along with measurement invariance across relevant groups. Cross-cultural applications must also establish linguistic and cultural equivalence through appropriate translation and adaptation methods (see, for example, Maneesriwongul & Dixon, 2004). Attention should be paid to the social media item within the Social Benefits dimension. Although this item demonstrated a strong factor loading, it may be less relevant to visitors who do not use social media. Future research should therefore examine its relevance and measurement invariance across age groups and other visitor characteristics, and consider broader, platform-independent conceptualisations of social benefits. In practice, museum managers may supplement this item with broader measures of social benefits that are not tied to social media use when surveying older visitor segments.

Further validation should also analyse the proposed scales' predictive ability regarding outcomes such as visitor satisfaction, loyalty, recommendation behaviour, and intentions to revisit.

## 6. Conclusions

In this study, we developed two multidimensional scales to measure museum quality and perceived value. Across four studies, the results supported a three-dimensional structure of museum quality, including the physical environment and experience, personnel quality, and originality. Additionally, we confirmed a four-dimensional structure of perceived value, comprising emotional benefits, social benefits, monetary price, and non-monetary price.

These findings provide initial evidence for the reliability and validity of both measurement instruments and advance our understanding of the museum experience by offering conceptually aligned measures of two important aspects of visitor experience. The developed scales also serve as practical tools for museum managers, allowing them to identify strengths and areas for improvement in the various dimensions of quality and perceived value, as well as to monitor visitor ratings over time.

However, due to the relatively small, non-random samples of visitors from two Slovenian museums and the use of the same sample for both scale refinement and nomological validity testing, the results should be viewed as preliminary evidence of the scales' validity. Future research should aim to cross-validate the scales using larger, independent, and more diverse samples, verify measurement invariance across different types of museums and cultural environments, and further investigate their predictive and nomological validity.

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## Appendix A

**Table A1.** Final validated museum quality scale.

| Dimension | Final Retained Item |
| --- | --- |
| Physical Environment and Experience | The museum's facilities are clean and well-maintained.<br>I appreciate the style inside this museum.<br>This museum is aesthetically attractive.<br>Visiting this museum is a pleasant experience. |
| Originality | I think this exhibition is novel.<br>I think this exhibition is unique. |
| Quality of personnel | When a visitor has a problem, service personnel show sincere interest in resolving it.<br>The attitude of service personnel demonstrates their willingness to help me.<br>The behaviour of service personnel gives me trust.<br>I can count on the personnel's professional knowledge of this museum.<br>The personnel are never too busy to respond to visitors' requests.<br>I can count on the personnel being friendly. |

**Table A2.** Final validated museum perceived value scale.

| Dimension | Final Retained Item |
| --- | --- |
| Emotional Benefits | Visiting this museum gives me a sense of joy.<br>Visiting this museum gives me pleasure.<br>Visiting this museum makes me feel good.<br>Visiting this museum gives me happiness. |
| Social Benefits | After the exhibition I couldn't wait to share my experience with my family and friends.<br>Visiting this museum can help me win more praise on social media.<br>Visiting this museum would make a good impression on other people. |
| Monetary Price | Visiting this museum is worth the money.<br>Visiting this museum is a good buy.<br>Visiting this museum is reasonably priced. |
| Non-monetary Price | Buying tickets for this museum required little effort.<br>Buying tickets for this museum required little time. |

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