

**Understanding Visitor Attention and Engagement through the Attention-Value Model:
Evidence from Two Museums in Belém, PA**

**Compreendendo a Atenção e o Engajamento do Visitante através do Modelo de
Atenção-Valor: Evidências de Dois Museus em Belém, PA**

**Comprendiendo la atención y el compromiso del visitante a través del modelo de
atención-valor: evidencias de dos museos en Belém, PA**

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Raul Ivan Raiol de Campos | Universidade Federal do Pará, Brasil | ORCID:

<https://orcid.org/0009-0002-2600-9698> | E-mail: raulcampos@ufpa.br

Karen Bastos Cardoso | Universidade Federal do Pará, Brasil |

ORCID: <https://orcid.org/0009-0002-1056-5470> | E-mail: karencardosok798@gmail.com

Lucas Oliveira da Silva | Museu Paraense Emílio Goeldi, Brasil |

ORCID: <https://orcid.org/0009-0005-6507-2376> | E-mail: lucassilva@museu-goeldi.br

Jorge Gabriel Costa | Universidade Federal do Pará, Brasil | ORCID: <https://orcid.org/0009-0009-9137-7797> | E-mail: jorge81gabriel08@gmail.com

Resumo

Os museus desempenham um papel importante na preservação e apresentação do patrimônio cultural, e moldam como os visitantes o compreendem por meio do design e interpretação das exposições. Por essa razão, examinar como as exposições guiam a atenção e atribuem valor é necessário para avaliar como elas se comunicam. Este estudo analisa como as exposições do Museu Forte do Presépio e do Museu da Arte Sacra se comunicam com os visitantes, utilizando o Modelo de Atenção-Valor de Bitgood como principal estrutura analítica. O estudo adota metodologia mista que reúne uma revisão bibliográfica, observação sistemática e coleta de dados no local por meio de questionários. Os questionários incluem itens abertos e fechados e são baseados no Modelo de Atenção-Valor. Os resultados sugerem que ambos os museus chamam a atenção dos visitantes inicialmente, mas mudanças limitadas nas exposições e uma faixa restrita de estímulos reduzem a atenção mantida. O pleno engajamento com o conteúdo da exposição foi registrado por apenas 14,2% dos visitantes no Museu Forte do Presépio e 8% no Museu da Arte Sacra. O engajamento dos visitantes aumentou quando estes puderam relacionar as coleções com suas próprias experiências, sugerindo que o valor percebido media a quantidade de atenção que eles dão as coleções. O estudo conclui que o Modelo de Atenção-Valor oferece uma forma clara de interpretar o engajamento dos visitantes nos museus, e adiciona evidências empíricas aos estudos de visitantes ao explicar como o design de exposições molda a atenção, o valor percebido e o desempenho comunicativo.

Palavras-chave: Atenção e Engajamento, Valor Percebido, Exposições de Museus, Modelo Atenção-Valor.

Abstract

Museums play an important role in preserving and presenting cultural heritage, and they shape how visitors understand it through exhibition design and interpretation. For this reason, examining how exhibitions guide attention and assign value is necessary for assessing how well they communicate. This study analyzes how exhibits at the Forte do Presépio Museum and the Arte Sacra Museum communicate with visitors, using Bitgood's Attention-Value Model as the main analytical framework. The study adopts a mixed-methods design that brings together a bibliographic review, systematic observation, and on-site data collection through questionnaires. The questionnaires include both open- and closed-ended items and are based on the Attention-Value Model. The results suggest that both museums draw visitors' attention at first, but limited changes in the exhibitions and a narrow range of stimuli reduce sustained attention. Full engagement with the exhibition content was recorded in just 14,2% of visitors at the Forte do Presépio Museum and 8% at the Arte Sacra Museum. Visitor engagement increased when visitors could relate the collections to their own experiences, suggesting that perceived value mediates how much attention they give. The study finds that the Attention-Value Model offers a clear way to interpret visitor engagement in the museums, and it adds empirical evidence to visitor studies by explaining how exhibition design shapes attention, perceived value, and communicative performance.

Keywords: Attention and Engagement, Perceived Value, Museum Exhibitions, Attention-Value Model.

Resumen

Los museos desempeñan un papel importante en la preservación y presentación del patrimonio cultural, y moldean cómo los visitantes lo comprenden a través del diseño y la interpretación de las exposiciones. Por esta razón, es necesario examinar cómo las exposiciones guían la atención y asignan valor para evaluar cómo se comunican. Este estudio analiza cómo las exposiciones del Museo Forte do Presépio y del Museo de Arte Sacro se comunican con los visitantes, utilizando el Modelo Atención-Valor de Bitgood como principal marco analítico. El estudio adopta una metodología mixta que combina una revisión de la literatura, observación sistemática y recogida de datos in situ mediante cuestionarios. Los cuestionarios incluyen tanto ítems abiertos como cerrados y se basan en el Modelo de Atención-Valor. Los resultados sugieren que ambos museos captan inicialmente la atención de los visitantes, pero los cambios limitados en las exposiciones y un rango limitado de estímulos reducen la atención sostenida. Solo el 14,2% de los visitantes del Museo Forte do Presépio y el 8% del Museo de Arte Sacro se implicaron plenamente con el contenido de la exposición. La participación de los visitantes aumentó cuando pudieron relacionar las colecciones con sus propias experiencias, lo que sugiere que el valor percibido media la cantidad de atención que prestan. El estudio concluye que el Modelo de Atención-Valor ofrece una forma clara de interpretar la participación de los visitantes en museos y aporta evidencia empírica a los estudios de visitantes al explicar cómo el diseño expositivo moldea la atención, el valor percibido y el rendimiento comunicativo.

Palabras clave: Atención y Compromiso, Valor Percibido, Exposiciones en Museos, Modelo de Atención-valor.

INTRODUCTION

Museums are settings where visitors encounter objects, stories, and interpretive material about human history and culture, shaping sensory, cognitive, and emotional responses. Museums, as informal learning settings, support inquiry and reflection and shape how people form both personal and shared identities. In this context, museums play an important role in preserving cultural heritage and supporting its value, educating the public, offering meaningful experiences, and protecting buildings, collections, and documents (Packer, 2008).

To understand how museums affect their audiences, researchers need systematic evaluation of exhibitions and of what visitors experience during their visits. Evaluation processes help institutions assess how they are meeting their objectives, locate strengths and weaknesses, and support strategic planning. Evaluation supports staff professional development, strengthens educational practices, improves communication with museum audiences, and helps build an evaluation culture within museums (IBRAM, 2022).

From a communication perspective, the relationship between museums and visitors is not limited to seeing exhibits; it also involves how visitors direct their attention and how they judge what the exhibits are worth to them.

Recent research has increasingly emphasized visitor-centered approaches to museum communication, highlighting the importance of understanding how exhibition design influences attention, engagement, meaning-making, and overall visitor experience. Contemporary studies have expanded traditional museum evaluation by integrating perspectives from user experience, behavioral observation, and cognitive engagement, providing more comprehensive frameworks for assessing exhibition effectiveness (King et al., 2023; King et al., 2025).

Likewise, systematic literature reviews have shown that current museum research increasingly focuses on visitor interaction, exhibition characteristics, and communication processes, while also pointing to the need for more empirically grounded methods capable of linking exhibition design with observable visitor behavior (Magi, 2025). Recent reviews further indicate that although visitor engagement and movement patterns have received growing attention, empirical studies directly examining attentional processes in real museum settings remain relatively limited, particularly in non-European and non-North American contexts (Ivanov; Velkova, 2025).

Within this context, the Attention-Value Model (Bitgood, 2013) continues to provide one of the most comprehensive theoretical frameworks for explaining how visitors allocate

attention, perceive value, and engage with exhibitions, yet its empirical application remains comparatively scarce. The present study contributes to addressing this gap by applying the model in Brazilian museums located in the Amazon region and by combining exhibition design assessment, systematic behavioral observation, and visitor perceptions to evaluate communicative performance.

Bitgood's (2013) Attention and Value theory argues that visitors' experiences depend largely on whether an exhibition can capture and engage their attention. In this model, an exhibition's success depends on whether its design, organization, and content guide visitors through three related stages of attention: capture, focus, and engagement. These stages influence how visitors engage with the museum setting and how they perceive the value of their visit.

This study uses the Attention-Value model to examine two museums in Belém do Pará: the Forte do Presépio Museum (MFP) and the Arte Sacra Museum (MAS). This study asks the following questions: (1) Do small visitor groups, compared with larger groups, are more likely to jointly form Attention-Value relationships during exhibition visits. (2) Can short visits be interpreted as signs of museum fatigue or as a lower perceived value of the museum experience? (3) Should low attention and limited value attribution during short visits be described as mindlessness? (4) Is the engagement stage of attention necessarily linked to the presence of holding power? Are visitors able to report their perceived level of attention and the value resulting from their museum visit?

Although museum learning, visitor behavior, and exhibition evaluation have been widely investigated, the empirical application of Bitgood's Attention-Value Model remains limited. In particular, there is a lack of studies examining how exhibition design affects visitors' attention, perceived value, and the communicative performance of exhibitions in real museum contexts. This limitation is especially pronounced in Brazilian museums, particularly in the Amazon region, where empirical research grounded in this model is still scarce. Consequently, important questions regarding the relationship between exhibition design, visitor engagement, and museum communication remain insufficiently explored.

Therefore, to fill this gap, the aim of this study is to analyze the communicative performance of the Forte do Presépio and Arte Sacra Museums by examining how visitors interact with exhibitions in terms of attention and value, using the Attention-Value Model as the main framework for analysis.

The contribution of this study to research on museum communication and visitor engagement lies in three main aspects. First, it provides an empirical application of Bitgood's Attention-Value Model to evaluate the communicative performance of museum exhibitions in Brazilian museums, particularly in the state of Pará, thereby extending the model to a geographical and cultural context that has received little empirical attention. Second, it adopts an integrated methodological approach that combines exhibition design analysis, systematic observation of visitor behavior, and behavioral indicators of attention, demonstrating how the communicative performance of exhibitions can be assessed empirically in real museum settings. Third, the findings show that visitor engagement is not determined solely by exhibition design quality; rather, it emerges from the interaction between exhibition characteristics, visitors' perceived value, motivational orientations, and the symbolic meanings they attribute to museum objects. This perspective contributes to a more comprehensive understanding of museum communication by highlighting the dynamic relationship between exhibition design and visitor experience.

MUSEUM COMMUNICATION AND VISITOR ATTENTION: CONCEPTS AND EVALUATION APPROACHES

During the twentieth century, research in museum studies increasingly examined how visitors behave and how they learn in exhibition settings. These studies show that exhibition outcomes depend on how museum content is arranged, conveyed, and interpreted by visitors, which places communication at the center of how museum experiences are formed.

Museums are communicative institutions that aim to preserve and interpret the cultural heritage of a particular region. Nielsen (2017) argues that museum communication is a set of articulation processes, including the sending of messages, the sharing of information, experimentation, and interaction. In this context, understanding is not only the receipt of information; it also involves making meaning, judging relevance, learning from experience, taking part in activities, and engaging in social interaction. As a result, the quality of a museum's communication shapes how visitors understand exhibitions and how they relate heritage to current social issues.

Recent international research has considerably broadened the understanding of museum communication by emphasizing visitor engagement and visitor experience as central dimensions of museum practice. Rather than focusing exclusively on the transmission of

information or learning outcomes, contemporary studies conceptualize museum experiences as multidimensional processes in which cognitive, emotional, social, reflective, and restorative dimensions interact to shape visitors' relationships with exhibitions and heritage (Packer, 2025). This perspective reinforces the idea that effective museum communication depends not only on the quality of interpretive content but also on its capacity to stimulate personal meaning-making, emotional connection, participation, and sustained engagement throughout the museum visit.

This shift is confirmed by the recent bibliometric review conducted by Nigatu, Trupp, and Teh (2024), which analyzed 407 peer-reviewed publications on museum visitor experiences. The authors demonstrate that international research has increasingly focused on visitor-centered approaches, highlighting visitor engagement, museum communication, digital technologies, co-creation, participation, and visitor experience as the main emerging themes in contemporary museum studies. These findings indicate that evaluating museum communication now requires understanding not only what museums communicate but also how visitors actively construct meanings and engage with exhibitions through multiple experiential dimensions. Within this contemporary context, the Attention-Value Model provides a valuable theoretical framework for explaining how communicative effectiveness depends on visitors' progression from initial attention capture to sustained engagement.

Museum staff often focus on learning outcomes, but learning depends on whether visitors attend to the objects and to the messages those objects displayed. Bitgood (2013) argues that to understand visitor attention, it is necessary to examine how visitors relate to the museum setting, which he describes as the physiology of attention. Thus, Rodriguez, Silva e Britto (2023) observe that, due to a museum's hegemonic communicative stance toward its audience, those responsible for the space's curation may fail to grasp how educational processes are constituted and the potential communicative contributions of an exhibition. This view helps explain not only how much learning takes place, but also the range of outcomes and the factors that shape a museum visit. By examining this relationship, researchers can assess how well museums communicate through their exhibitions.

Visitor attention depends on the ties visitors form with the objects on display and with the meanings communicated through interpretive text and media. Visitors develop their own understanding of heritage through their engagement with exhibitions, meaning the same display can produce different interpretations (Nielsen, 2017). To clarify the concepts and variables that shape visitor experience and learning, Bitgood (2013) reviewed more than eighty years of

museum research and proposed a framework for assessing how well museums communicate with visitors.

Bitgood (2013) cites early studies by Gilman (1916), Robinson (1928), Melton (1935), and Porter (1938) that examined museum fatigue and related visitor behavior, including stopping patterns, viewing time, and how time and tracking were recorded. From the 1960s onward, researchers broadened their work to include formative evaluation (Shettel et al., 1968). Relevant concepts include sustaining visitors' power and attention (Screven, 1999), mindfulness and mindlessness (Moscardo, 1999; Langer, 1989), contextual learning (Falk; Dierking, 1992, 2012), and the value of choice as explained through foraging theory (Rounds, 2004).

Rounds (2004) was closely related to Bitgood's work because it framed visitor decisions in terms of cost–benefit analysis. This approach suggests that visitors' attention is closely linked to their interest and curiosity, and that these factors reflect an implicit value that shapes how people behave in exhibition settings.

Attention And Value

The Attention-Value model was developed from a broad review of research on how visitors allocate their attention. As Bitgood (2013) stated, the attention value model draws on more than 80 years of visitor research and incorporates key elements from established theories and models of attention. The model was developed from the view that learning outcomes improve when visitors are strongly engaged and sustain their attention.

Based on research in psychology and visitor studies, the Attention-Value model describes how museum visitors decide what to focus on and how their sense of value shapes those choices. Value can be defined as the perceived benefits compared with the costs involved, including time, effort, and money (Bitgood, 2013). This relationship helps clarify how visitors' attention influences their experience of an exhibition and how they judge its value.

In the Attention-Value model, attention is described as a sequence of three related stages: capture, focus, and engagement (Bitgood, 2013). Capture refers to the first stage in which a visitor notices a stimulus and directs attention toward it. Focus refers to a visitor's choice to spend time and effort when the experience seems worthwhile. Engagement refers to sustained attention that supports learning and other positive experiences, such as relaxation, social interaction, reduced cognitive effort, and strong interest. As Bitgood (2013, p. 66) notes,

attention ranges “from unfocused, shallow processing of information to highly focused, deep processing”.

In this model, value is defined explicitly as the balance between costs and benefits. From an economic view, the satisfaction people gain from exhibitions can be weighed against the time, effort, and other resources they invest (Bitgood, 2014). Attendance counts alone do not capture educational impact. Serrell (1997) suggests that the amount of time visitors spend in an exhibition is a more useful measure of interest, engagement, and what they retain, which is consistent with Bitgood’s view.

The Attention-Value model treats attention and time as costs, and it treats learning, enjoyment, restoration, and engagement as benefits. Visitors tend to pay attention to an object when they judge that its perceived benefits outweigh the perceived costs (Bitgood, 2013).

Bitgood (2013) explains the relationship between attention and value using four components that can be applied in practice: Person Setting, Response Impact, Explanatory Mechanisms, and Inferred Outcomes (Chart 1). Person Setting refers to both individual factors and features of the surrounding environment. Personal factors refer to cognitive and emotional processes, individual interests, prior knowledge, time constraints, physical stamina, and current stress levels. Contextual factors include social conditions and physical environment, such as how an exhibition is designed and whether the space supports basic comfort (Bitgood, 2013).

By examining both internal and situational factors, museums can interpret visitor experiences with greater clarity (Campos; Costa; Silva, 2021). Motivation, expectations, and perception shape the level and form of engagement. Motivation should be treated as separate from external conditioning, since it refers to an internal force that shapes visitors’ behavior (Bergamini, 2006; Staudt, Reggiori, 2016).

Response impact describes observable visitor behavior, including stopping, reading, looking at materials, and later recalling the content. These behaviors serve as observable measures of attention and perceived value, which researchers can use to infer how decisions are made under the Available Alternative Theorem. This theorem argues that attention is distributed according to the options available at a given time, which implies an implicit assessment process that seeks to limit effort while increasing expected benefit (Bitgood, 2013).

Explanatory mechanisms relate individual characteristics and setting conditions to behavioral responses by focusing on psychophysiological processes such as fatigue, satiation, energy levels, and decision-making. These mechanisms explain how a heavier workload lowers perceived value and, in turn, reduces engagement (Bitgood, 2013).

Inferred Outcomes refer to the results of a visit, such as what visitors learn and understand, how they investigate, and the extent to which they experience flow, restoration, and immersion (Bitgood, 2013). These outcomes align with sustained, engaged attention, often described as mindfulness, and they differ from the mindlessness discussed by Langer (1989) and Moscardo (1999). Taken together, these concepts show how museum communication shapes visitors' experiences.

Chart 1: Variables of Attention-Value Model by Bitgood

Attention/Value Variables	Person Setting	Explanatory Mechanism	Response-Impact	Inferred Outcomes
Definitions	Measurable factors that influence response-impact	Processes that connect person-setting and response-impact variables	Measures of reactions to the experience	Outcomes inferred from experience
Examples	Personal factors: Knowledge, interests, schedule, etc. Setting factors: Physical exhibits Social influences: Family interactions	Psychophysiological processes: Searching, Fatigue, Satiation, Energy Level and; Decision Making	- Look at the object - Approach - Choose - Stop and look - Reading text - Thinking about - Content recall - Verbal Description	- Learning - Knowledge acquisition - Restoration - Investigation - Flow - Immersion

Source: Adapted by the authors, 2024.

The Attention-Value model frames museum evaluation around how visitors direct and sustain attention, rather than treating learning outcomes as the only basis for assessment. Bitgood (2013) notes that learning often occurs once a learner's attention is fully engaged. Exhibition evaluation should examine how design and communication guide and sustain visitor attention across the full visit.

The Value Factor and Communicative Performance

Value is often formed without deliberate thought, and it becomes clear when a visitor's attention is captured (Bitgood, 2013). Paying attention requires time, physical effort, and mental effort, and its benefits may include enjoyment, well-being, and experiences that feel meaningful. These benefits align with the outcomes predicted by the Attention-Value model.

Packer (2008) found that visits to museums can offer benefits beyond learning, especially by supporting psychological well-being and helping visitors recover mentally. Bitgood (2013) notes several benefits, including relaxation, social engagement, a sense of flow and immersion, learning, and psychological restoration.

Then, to obtain that typical measures of engagement and value in the context of a museum visit, is necessary to do observations of the amount of time visitors spend at an exhibit, how extensively they read labels, and how deeply they discuss what they are seeing, as well as self-report measures of affective, cognitive and behavioral engagement (Dorph; Cannady; Schunn, 2022).

When visitors focus their attention on the exhibition content, they are often seeking these benefits, which shapes their sense of value and indicates how well the exhibition communicates. The Attention-Value model supports the study of exhibition design, visitor behavior, levels of engagement, and experience outcomes, providing a structured way to examine museum communication.

The Arte Sacra and Forte do Presépio Museums

The study took place at the Museum of Arte Sacra (MAS) and the Museum of the Forte do Presépio (MFP), both in the Cidade Velha neighborhood in the historic center of Belém. These institutions were created as part of the Feliz Lusitânia Project (1997–2002), an urban and cultural revitalization program focused on restoring and adapting historically important buildings for use as museums (Costa; Miranda, 2020; Costa, 2007).

The MAS is located in the former Episcopal Palace, also known as the Jesuit College, and in the Church of Santo Alexandre. Both buildings were listed as National Historical and Artistic Heritage sites by the National Institute of Historical and Artistic Heritage (IPHAN) in 1962. Opened in 1998, the museum is housed in a complex whose architecture and symbolism shape how visitors experience the site (Longo, 2007).

The Construction of the present Church of Santo Alexandre began around 1698 and concluded in 1719. Constructed of stone, the building was first consecrated to Saint Francis

Xavier and later renamed Saint Alexander. After restoration and adaptive reuse work, the complex now houses more than 350 objects, including religious images, silver items, paintings, liturgical pieces, and archaeological materials. Together, these elements create a dense setting for communication where architecture, objects, and narratives interact and shape how visitors understand what they see.

The museum at Forte do Presépio, previously known as Forte do Castelo, has been listed by IPHAN as a national heritage site since 1962. Built in 1616, the fort marked the start of Belém and became a key part of Portuguese colonial settlement and territorial control along the Amazon River (Lopes, 2011; Longo, 2007; Pimentel, 2017). Its presence shaped how the city used space and how its urban form developed over time.

Having served military purposes for several centuries, the Forte do Presépio was restored in the early 2000s and later converted into a museum (Pará, 2021). Longo (2007) reports that archaeological work was carried out before restoration and identified about 70,000 fragments, such as Indigenous artifacts, ceramics, weapons, structural remains, and parts of military infrastructure. These results informed both the exhibition narrative and the spatial layout.

Recent research supports the view that the MFP remains important for both cultural life and tourism. Oliveira and Britto (2020) report that 75% of local respondents viewed Forte do Presépio as a place of high historical importance. The study of Fonseca et al. (2015) also notes its role in the regional tourism circuit, drawing students and visitors from within the country and from abroad.

Taken together, the MAS and the MFP are heritage sites that allow visitors to engage with the region's cultural, historical, and symbolic meanings. Their architectural features, exhibition layout, and curatorial narratives make them well suited for applying Bitgood's (2013) Attention-Value model to assess communicative performance and visitor experience.

METHODOLOGY

This study used an exploratory research design to develop a clearer understanding of the phenomenon or research problem under study (Farias Filho; Arruda Filho, 2013). The study proceeded in two related stages: first, a review of relevant literature, and second, on-site fieldwork at the Museum of Arte Sacra and the Museum of the Forte do Presépio.

This study used a mixed methods design that combined qualitative and quantitative data, following the approach described by Pereira et al. (2018), which supports interpretive analysis and helps identify patterns in visitor behavior. Data were collected through semi-structured interviews that included both open and closed-ended questions and were conducted with visitors at each museum.

Interviews are well suited for gathering detailed accounts of participants' perceptions, motivations, and experiences (Farias Filho; Arruda Filho, 2013). During the fieldwork period, from May 15 to June 30, 2024, 100 interviews were conducted at each museum. The sampling was non-probabilistic specifically, convenience or accidental (Farias Filho; Arruda Filho, 2013). This sampling strategy was considered appropriate because of the exploratory nature of the study, the absence of a complete sampling frame from which visitors could be randomly selected, and the spontaneous and variable flow of visitors in both museums. Convenience sampling also allowed data to be collected immediately after the museum visit, helping participants recall their perceptions, attentional responses, and interactions with the exhibitions.

Although this procedure was suitable for identifying patterns of attention, perceived value, and engagement in real museum settings, the findings should not be statistically generalized to the entire visitor population of either museum. The results represent the experiences of the visitors included in the study and should be interpreted as exploratory evidence that may guide future research based on probability sampling, larger samples, and different visitation periods.

The questionnaires were administered in person and recorded the participants' responses during the interview (Farias Filho; Arruda Filho, 2013). Before the main data collection, the questionnaire was pilot-tested with a small group of museum visitors to evaluate the clarity, comprehensibility, and applicability of the items within the museum context. Feedback obtained during the pilot test led to minor revisions in the wording, sequencing, and formatting of selected questions, improving their clarity and reducing potential sources of ambiguity.

The questionnaire was developed based on the theoretical framework proposed by Bitgood (2013), ensuring conceptual alignment between the study's core constructs attention, engagement, perceived value, and visitor behavior, and the empirical indicators used to measure them. This theoretically grounded approach contributed to the instrument's content validity by ensuring that each item adequately represented the dimensions of the Attention-Value Model investigated in this study. Sketches were prepared to outline the exhibition areas and main

circulation paths, which supported the analysis of how visitors moved through space and where their attention tended to focus.

The study used the Attention-Value model (Bitgood, 2013) as the main framework for analysis, focusing on visitors' behavior and assessing the communicative performance of long-term exhibitions. Technical site visits were conducted to assess the quality of the exhibition design, focusing on attention-related design factors described by Bitgood (2014). These factors supported classifying exhibitions as low, medium, or high quality in terms of how they manage visitor attention.

The operationalization of the attention indicators was grounded in Bitgood's (2013) Attention-Value Model, which conceptualizes visitor attention as a sequential process comprising three hierarchical stages: attention capture, attention focus, and engagement. Rather than relying exclusively on self-report measures, this study translated these theoretical constructs into observable behavioral indicators systematically recorded during visitors' interactions with the exhibitions.

The attention capture stage was operationalized through behaviors reflecting visitors' initial orientation toward exhibition elements, including stopping in front of exhibits, visually inspecting objects, approaching displays, or briefly directing visual attention to specific exhibition components. These behaviors represent the initial allocation of attentional resources and correspond to the first stage of Bitgood's model.

The attention focus stage was operationalized through behaviors indicating the selective and sustained allocation of cognitive resources, such as intentionally choosing particular objects to examine, reading interpretive texts, remaining at exhibits for extended periods, and directing attention to specific exhibition components. These behaviors suggest that visitors moved beyond initial attraction and engaged in more purposeful observation.

The engagement stage was operationalized through behaviors reflecting deeper cognitive processing and meaning-making, including discussing exhibition content, relating exhibits to prior knowledge or personal experiences, expressing reflective comments, and subsequently recalling exhibition information. Consistent with Bitgood (2013), Moscardo (1999), and Screven (1999), these behaviors were interpreted as indicators of mindful attention and higher levels of cognitive engagement.

The selection of these behavioral indicators was informed by a long tradition of visitor studies demonstrating that observable behaviors, such as stopping, viewing time, object selection, reading interpretive materials, verbal interaction, and content recall, constitute

reliable proxies for attention and engagement in museum settings (Gilman, 1916; Robinson, 1928; Melton, 1935; Serrell, 1997; Screven, 1999; Bitgood, 2013). Because attention is an internal cognitive process that cannot be observed directly, the use of systematically recorded behavioral indicators provides a valid and theoretically grounded approach for assessing visitors' attentional engagement with museum exhibitions.

Qualitative data obtained from the open-ended questionnaire responses were analyzed using Bardin's (1977) content analysis methodology. The analytical process followed three sequential stages. The first stage, pre-analysis, involved repeated readings of participants' responses to achieve data familiarization and identify preliminary patterns. The second stage, coding and categorization, consisted of organizing meaning units into thematic categories informed by the theoretical dimensions of the Attention-Value Model (Bitgood, 2013). The third stage, interpretation, involved examining the relationships between the identified categories, the quantitative findings, and the systematic observational data collected during fieldwork.

To enhance the reliability and consistency of the qualitative analysis, the coding process was guided by a predefined coding framework derived from the study's core theoretical constructs, namely attention capture, attention focus, engagement, perceived value, and explanatory mechanisms. Coding decisions were applied consistently across all responses to ensure analytical coherence. Furthermore, the qualitative findings were triangulated with systematic observation records and quantitative results, enabling the convergence of multiple sources of evidence and strengthening the credibility of the study's interpretations while reducing the potential for interpretative bias.

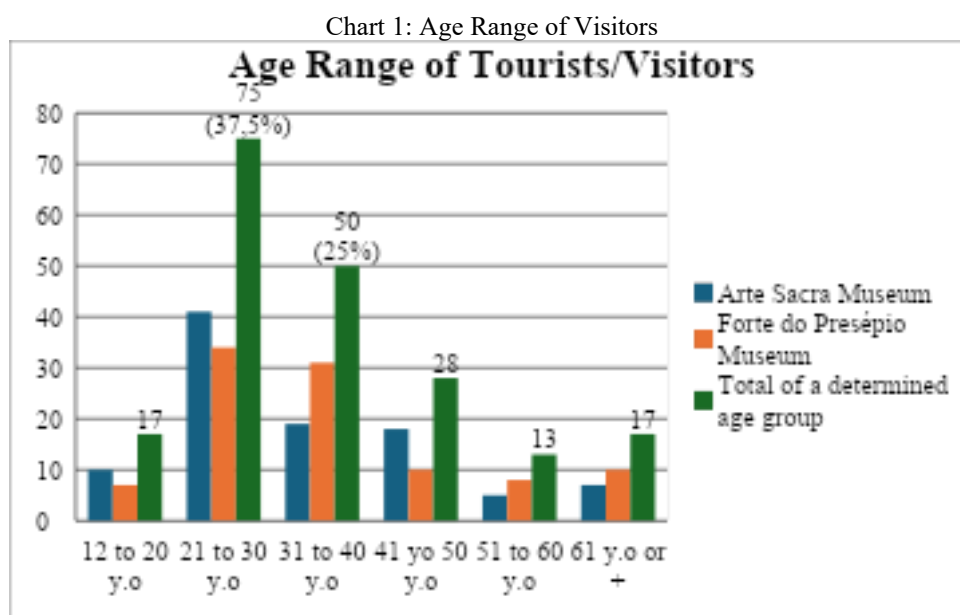
Quantitative data were entered into a spreadsheet, checked for consistency, and analyzed using descriptive statistics, including absolute frequencies, percentages, means, and comparative indicators between museums and exhibition wings. These descriptive measures were used to characterize visitor profiles and summarize behavioral patterns associated with attention, perceived value, and engagement.

Demographic Data and Analysis of Visitors' Motivation Levels

Gender, nationality, state of origin, age group, and education level were recorded to describe the sample and to assess relationships among these variables. Among the 200 participants, 41 men were surveyed at the MFP and 49 at the MAS, and these 90 respondents

accounted for 45% of the sample. Female participation was higher at both institutions, with 59 respondents at the MFP and 51 at the MAS, representing 55% of all visitors.

Most visitors were Brazilian (97%), and 3% came from other countries. Among participants from Brazil, 45% lived in the state of Pará, while 53% lived in other Brazilian states. In the age distribution, visitors aged 21–30 formed the largest group, accounting for 37% of respondents across both museums. The 31–40 age group came next and made up 25% of the sample. The smallest age group among the visitors was those aged 51–60 years, accounting for 6,5% of the total (Chart 1).



Source: Elaborated by the authors, 2024.

In terms of educational attainment, most participants reported relatively high levels of education. Only 0,5% of respondents reported that they had completed, or partly completed, elementary education. At the secondary level, 6% did not complete high school, whereas 17,5% completed it. Regarding higher education, 40,5% had completed an undergraduate degree, 17,5% had not completed an undergraduate degree, and 14% had completed postgraduate studies. In the sample, 3,5% reported pursuing postgraduate education, suggesting that most visitors had relatively high levels of education.

Bitgood (2013) does not offer a direct way to measure museum visitors' motivation, but he stresses that visitors' existing interest and knowledge matter. These factors shape the value visitors assign to an exhibition before they arrive and influence the level of attention they maintain during the visit. In this view, stronger motivation makes the likelihood of attention and perceived value increase.

In this study, visitors' motivation was inferred from their spoken responses during dialogue-based interactions. This analysis followed the framework used by Campos, Costa, and Silva (2021) and was informed by the motivation concepts described by Staudt and Reggiori (2016) and Falk's (2006) set of motivational categories. After examining the variable "Person Setting," three levels of motivation were identified. The first level, referred to as standard motivation, covers reasons such as seeking leisure or relaxation, taking advantage of a chance or opportunity, or engaging with exhibitions in a brief or surface-level way. Although it is driven by internal interest, this form of motivation is often observed among museum visitors. The second level, called elaborate motivation, involves a stronger interest in cultural topics, museum collections, and the content of exhibitions. This level was identified from more detailed, reflective responses suggesting that visitors maintained sustained and engaged attention during the visit, supported by their initial motivation. The third level, termed conditioning, refers to visitors who came to the museum mainly because they were accompanying someone or were brought by another person. Their responses indicate that the visit was driven more by social obligation or habit than by their own independent interest.

At the MFP, 36% of visitors showed standard motivation, 44% showed elaborate motivation, and 20% were classified in the conditioning category. At the MAS, 50% of respondents showed standard motivation, 38% showed elaborate motivation, and 12% showed conditioning. Standard motivation had little impact on visitors' attention levels. Instead, visitors depended mainly on the exhibition's design and organization to sustain attention and perceived value. By contrast, visitors with elaborate motives paid closer attention to the exhibition content and showed little distraction or fatigue during the visit. Visitors placed in the conditioning level focused mainly on the people they came with. Some moved through the exhibition at their companions' pace and engaged only a little with the displays, while others set the pace themselves and shaped the timing of the visit. In the second case, both participants appeared to sustain attention more readily through direct interaction with one another, which suggests the presence of dynamic mediation.

RESULTS AND DISCUSSION

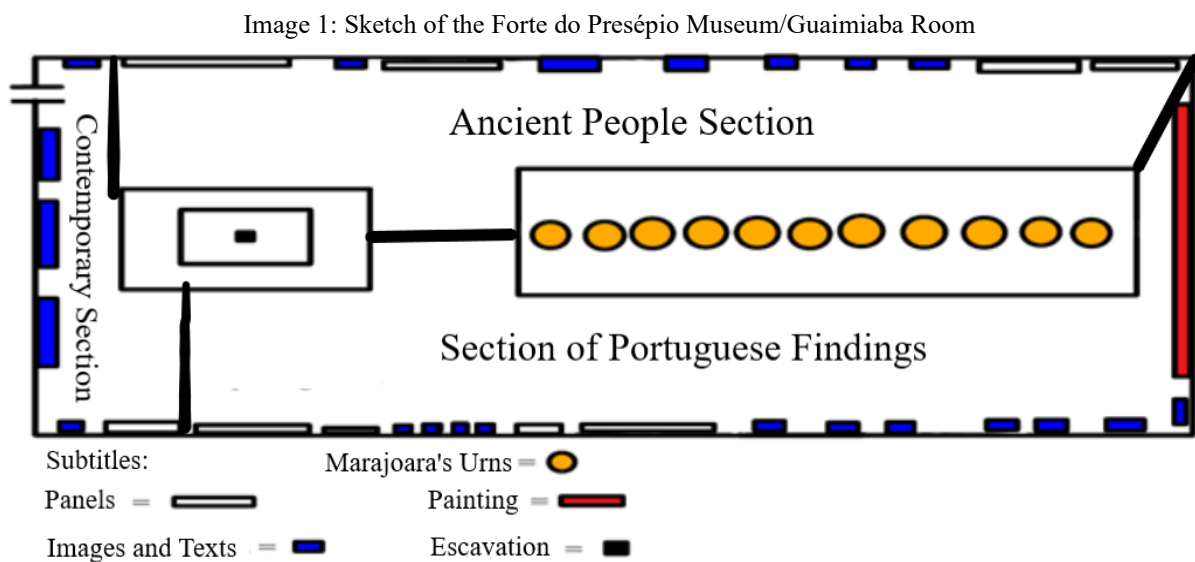
This section brings together empirical results and theoretical reading based on the Attention-Value Model (Bitgood, 2013, 2014). It considers how person-setting variables,

response–impact variables, explanatory mechanisms, and inferred outcomes work together to shape visitors’ attention, perceived value, and learning at the MFP and at the MAS.

Person–Setting Variables: Exhibition Design and Visitor Motivation

Exhibition Configuration and Spatial Organization

The long-term exhibition at the Forte do Presépio Museum is set in the Guaimiaba Room (Image 1), which visitors enter just after the ticket office, a placement that tends to draw attention early in the visit. The exhibition is arranged in a chronological, clockwise order, beginning with Ancient Peoples, moving through Portuguese contact, and ending with present-day traditional communities. A structured narrative lowers the mental effort required for visual search and supports visitors’ decision-making, especially among those with higher intrinsic motivation.



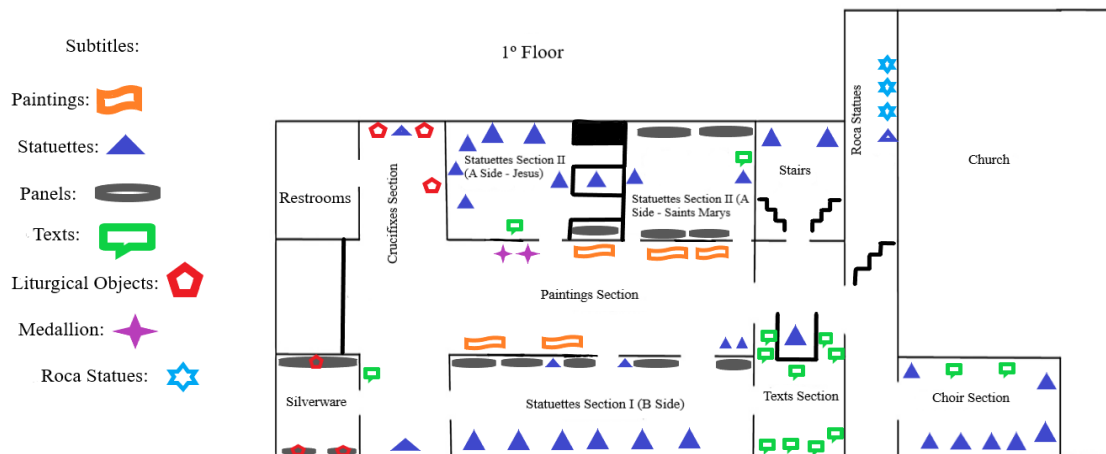
Source: elaborated by the authors, 2024.

Organizing the exhibition into three thematic wings, Ancient Peoples, Portuguese, and Contemporary, helps visitors interpret what they see and aligns with Gestalt principles (Bitgood, 2014). This layout may support steadier attention throughout the visit. Repetition of similar artifacts, especially in the Ancient Peoples Wing, may lead to visitor Satiation. This can reduce sustained engagement over time, despite high initial capture.

By contrast, the Arte Sacra Museum’s long-term exhibition is arranged in a non-linear way, so visitors can move freely through nine thematic wings (Image 2). This design supports greater autonomy, but it also requires visitors to bring more intrinsic motivation and prior

knowledge. From an attention–value view, a highly open setting may support visitors with elaborate motivation, and self-directed goals, but it may weaken attentional focus for those standard or conditioned motivation because there are fewer spatial cues to guide attention from initial capture to sustained engagement.

Image 2: Sketch of the long-term exhibition of the Arte Sacra Museum.



Source: Elaborated by the authors, 2024.

Comparative Design Analysis through the Attention-Value Model

The analysis of exhibition design factors in Tables 1 and 2 shows that both museums reached a medium level of overall performance (MFP = 2,0; MAS = 1,92). High scores for line-of-sight placement, contrast with the background, and navigation suggest that both institutions are successful at capturing attention. Consistently low scores for Prompting and Stimulus across both museums' exhibitions suggest structural limits in sustaining attention and supporting deeper cognitive engagement.

This study assessed museum attention features, infrastructure, exhibition collections, and museum content using design-related factors (Bitgood, 2013, 2014). Each factor was scored on a four-level scale: Absent (0), Low (1), Medium (2), and High (3).

Table 1: Analyses of factors related to Exhibition Design based upon Attention Value Theory (Bitgood, 2013, 2014) in the long-term exhibition of the Museum of Arte Sacra

Areas of the MAS/ Design/Attention analysis	Texts	Statuettes I	Statuettes II (side A)	Statuettes II (side B)	Crucifixes	Silverware	Paintings	Images of Roca	Choir
Isolation	High	Medium	Medium	High	High	Low	Medium	Low	Low
Relative size	Low	Medium	High	Medium	Medium	Medium	Medium	Medium	Low
Line-of-sight placement	High	High	High	High	Medium	Medium	High	High	Medium
Visual search sequence	Low	Medium	Medium	Medium	Medium	Medium	Medium	Medium	High
Contrast with background	High	High	High	High	High	Medium	High	High	High
Visual competition	High	Medium	Medium	Medium	Medium	Medium	Low	Medium	High
Object satiation	High	Medium	High	Low	Low	Low	Low	Low	Medium
Good navigation	Medium	High	High	Medium	High	High	High	Medium	Medium
Gestalt	High	Low	Medium	Medium	Medium	Low	Medium	High	High
Learned habits	High	Low	Medium	Medium	Low	Low	Low	Low	High
Limited capacity	Low	High	High	Medium	High	Low	High	Medium	Medium
Powerful distractors	Medium	Medium	Low	Low	High	Medium	Low	Medium	High
Prompting	Low	Low	Low	Low	Low	Low	Low	Low	Low
Stimulus	Low	Medium	Low	Low	Low	Medium	Medium	Low	Low

Source: Elaborated by the authors, 2024.

Bitgood (2014) argues that many exhibitions draw visitors’ attention but do not reliably help that attention develop into sustained engagement. These findings support the argument that when interpretive cues are scarce and sensory or interactive input is limited, visitors are less likely to move from focused attention to meaning-making, which in turn reduces their perceived value.

Table 2: Analysis of the factors related to the Design of Exhibitions based upon Attention/Value Theory (Bitgood, 2013) of the Museum of Forte do Presépio

Areas of the MFP/ Design/Attention analysis	Ancient peoples Wing	Portugueses wing	Contemporary wing
Isolation	Medium	Low	High
Relative size	High	Medium	Medium
Line-of-sight placement	High	Medium	Medium
Visual search sequence	Medium	Medium	Medium
Contrast with background	Medium	Low	Medium
Visual competition	Low	Low	Low
Object satiation	High	High	Low
Good navigation	Medium	Medium	Medium
Gestalt	Medium	Medium	Low
Learned habits	High	High	Low
Limited capacity	Medium	Medium	Medium
Powerful distractors	High	Medium	Medium
Prompting	Medium	Low	Low
Stimulus	High	Low	Low

Source: Elaborated by the authors, 2024.

Response–Impact Variables: Statistical Evidence of Attention and Value Dynamics

The response–impact variables were analyzed using the Attention–Value Model (Bitgood, 2013), which treats visitor experience as a selective process that moves through three stages of attention: capture, focus, and engagement. Within this framework, statistical measures should not be read as absolute indicators of performance. Instead, they provide empirical evidence of how visitors allocate their limited attention across the exhibition’s content.

Visitor behaviors such as stopping to look, selecting items, thinking about them, reading text, speaking aloud, and examining objects were defined as observable indicators of these stages of attention. Additional behaviors recorded were, such as rushing and photographing to provide context for attentional competition and possible dispersal. These behaviors matter for

analysis because they can mark shifts between stages of attention and indicate how perceived value is being formed.

To assess visitors' stages of attention in both museums, the questionnaires included symbols that represented visitor behavior (image 3). The exhibitions were evaluated using mean measures of captures, focus, and minimum engagement, interpreted in relation to the number of panels, collections, and texts displayed.

Image 3: Response-impact variables

Icons for Impact-Responses

Stop and Look - ● (capture stage)	Look at object, without stopping - ,
Choose - ✕ (focus stage)	Photography - ✨
Think about - ☁ (engagement stage)	To hurry, pass by - ➡
Read text - □	Approach the other - ▲
Verbal description - +	Recovery - ○

Source: Elaborated by the authors, 2024

Bitgood (2013) does not set fixed numerical cutoffs for judging exhibition performance. In this study, minimum mean values were set for each attention stage, using the number of objects, panels, and text elements shown in each wing. This choice follows the Theorem of Available Alternatives (Bitgood, 2014. p. 3): “visitors engage with exhibit components that are perceived as higher value than the alternatives available”.

At the MFP, the minimum mean values needed to maintain each level of attention differed across the museum wings. In the Ancient Peoples Wing, the thresholds were set at 14 occurrences for capturing attention, 7 for focus, and 4 for engagement. The Portuguese Wing set slightly higher average thresholds: 16 for capture, 8 for focus, and 4 for engagement. The Contemporary Wing displayed fewer elements and set lower thresholds of 4 for capture, 2 for focus, and 1 for engagement. Using separate baselines makes it possible to interpret performance within its setting, rather than applying the same standard across all cases.

The Portuguese Wing recorded the highest engagement score, averaging 2,6 out of 4, and it exceeded the score reported for the Ancient Peoples Wing (2,0 out of 4,0). It received a

score of 0 out of 4, and the Contemporary Wing received 0,4 out of 1,0. From an analytic standpoint, this result matters because the Portuguese Wing drew more engagement even though only two exhibition design factors were rated as high quality, while the Ancient Peoples Wing received high-quality ratings on 6 of the 14 factors. This difference supports Bitgood's (2013) view that perceived value and engagement depend not only on formal exhibition design, but also on how object meaning and familiarity interact with visitor interest and other personal factors.

The statistical evidence indicates that common, familiar items, including coins, buttons, porcelain, and other small personal objects, drew attention in the Portuguese Wing because they prompted quick mental associations. By contrast, at the Ancient Peoples Wing systematic observations revealed that visitors initially devoted considerable attention to archaeological artifacts, particularly the first Marajoara ceramic objects displayed in the wing. However, as the visit progressed, visitors increasingly reduced their viewing time, skipped interpretive panels, and moved more rapidly through subsequent displays containing similar objects. This behavioral pattern provides direct empirical evidence of visitor satiation, supporting the interpretation proposed by the Attention-Value Model (Bitgood, 2013).

At the MAS, limits on visitor attention were more evident. Of the nine exhibition wings, only the Silver Wing reached the minimum engagement threshold, with a score of 1 out of 1 at the engagement stage. Text Wing and Statuettes Wing II (Jesus) came close to the minimum threshold but fell short, with engagement scores of 0,9 out of 2 and 0,8 out of 2, respectively. These results suggest that even when attention is captured and focus is present, moving from attention to sustained engagement is still uncertain.

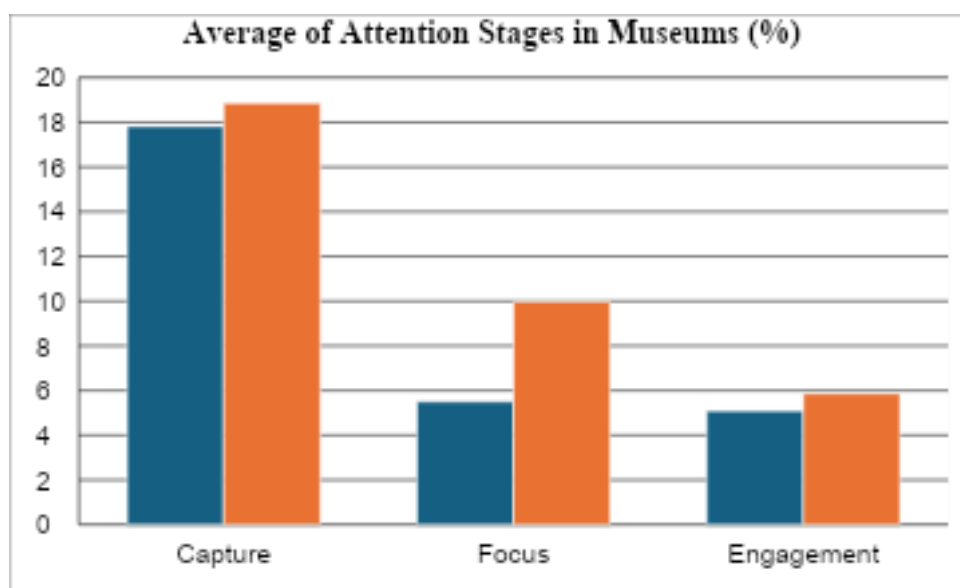
The Silver Wing drew full engagement even though its exhibition design and structure received low ratings. This apparent contradiction aligns with the Attention-Value Model. The silver and gold liturgical objects, including chalices, crowns, and monstrances, stood out in perception and carried strong intrinsic value. These features raised their perceived value and lowered the degree to which visitors compared them with other available options. In other wings, the large number of near-identical statuettes created a sense of repetition, which likely increased museum fatigue (Porter, 1938) and led visitors to disengage their attention more quickly.

When the attention stages are combined at the museum level, the statistics provide additional evidence that visitors attend some exhibits more than others. At the MFP, the reasonable average thresholds were 35 for capture, which corresponds to full collection (100%),

17 for focus, and 8 for engagement. Based on the data, visitors had an average capture score of 17,82, which suggests they paused and observed about 51% of the collection. The average focus score fell to 5,5, suggesting close attention to about 31% of the items observed at the start. Average engagement was 5,1 items, which is below the minimum engagement threshold of 8. This indicates that visitors engaged in a sustained way with only 14,2% of the total collection, suggesting limited mindfulness during the exhibition.

The MAS showed a similar pattern, but with stricter limits. Using thresholds of 73 for capture, 34 for focus, and 15 for engagement, the visitor sample recorded an average capture score of 18. The sample consists of 85 objects, corresponding to 25 classes. This accounts for 83% of the total collection. Focus averaged 9,97 objects, while engagement declined to 5,87, which is under half of the minimum engagement benchmark. Statistically, this suggests that visitors interacted with only about 8% of the MAS collection, which aligns with prior work on mindlessness (Moscardo, 1999) and with evidence that quitting rules shape how people decide to stop engaging (Rounds, 2004).

Graph 2: Average Stages of Attention in the MFP e no MAS



Source: Elaborated by the authors, 2024

Beyond the descriptive statistics, the observational data revealed a progressive decline in visitors' attention throughout the exhibition sequence. Visitors generally stopped at a large number of objects during the initial stages of the visit, but fewer exhibits received prolonged observation or reflective engagement as the visit progressed. Qualitative responses further showed that visitors remained engaged primarily when they could relate the exhibits to their previous knowledge, personal experiences, or specific interests. The convergence of behavioral

observations, qualitative evidence, and quantitative indicators provides stronger empirical support for the hierarchical stages proposed by the Attention-Value Model.

Explanatory Mechanisms: Psychophysiological Mediation of Attention and Value

Bitgood (2013) argues that the explanatory mechanisms shown in Graph 3 are psychological and physical processes that shape visitors' attention and general disposition. These factors shape the visitor's experience by influencing how they subconsciously judge the time and effort needed to engage with particular elements, which then affects how they assign value. This study examined explanatory mechanisms by analyzing psychophysiological processes, including Search, Energy Level, Fatigue, Decision Making, and Satiety, along with design-related and visitor-related factors. Based on systematic observation, each factor was classified as showing Low, Medium, or High levels of evidence.

Of these mechanisms, Search serves as the basic attention process because it shapes how visitors explore and supports the first choice of stimuli that may then move into later stages of attention. From a theoretical view, Search serves as an entry point for capturing attention. It lets visitors scan the exhibition setting and, often without awareness, indicate what they see as valuable by deciding where to direct their limited attention.

The data show that Search occurred frequently in both museums, with 66 high-occurrence records at the MFP and 56 at the MAS. Average Search levels were also common, with 26 visitors at the MFP and 36 at the MAS. Low Search levels were reported for 8 individuals at the MFP and 6 at the MAS. These figures suggest that visitors at both institutions tended to explore, which may have supported capturing their attention early in the visit.

The Energy Level mechanism provides a clearer frame for understanding this readiness to explore. Bitgood (2013) argues that the amount of energy visitors has, shapes how willing they are to engage physically and interact with exhibition materials. The data indicate that most visitors reported high energy levels, with 80 individuals at the MFP group and 84 at the MAS group, while medium energy levels were reported for 19 and 15 individuals, respectively. In each museum, only one visitor showed low energy levels. These findings suggest that lower engagement is unlikely to be mainly due to physical or psychophysiological fatigue, since most visitors appeared to have enough energy to maintain attention.

In line with this result, fatigue was generally low in both museums: 87 participants at the MFP and 88 at the MAS showed minimal signs of fatigue. High fatigue was reported by

two visitors at the MAS and by none at the MFP. Moderate mental fatigue was reported by 13 individuals at the MFP group and 10 at the MAS group. From a theoretical viewpoint, these data indicate that the primary limits on attention were not physical fatigue or unusually long visit length. Fatigue is an important factor that can shape how visitors perceive content and how much they engage with it. When visitors feel tired, they may stop engaging with some content because the mental effort and time needed to make sense of it can seem too demanding (Bitgood, 2013).

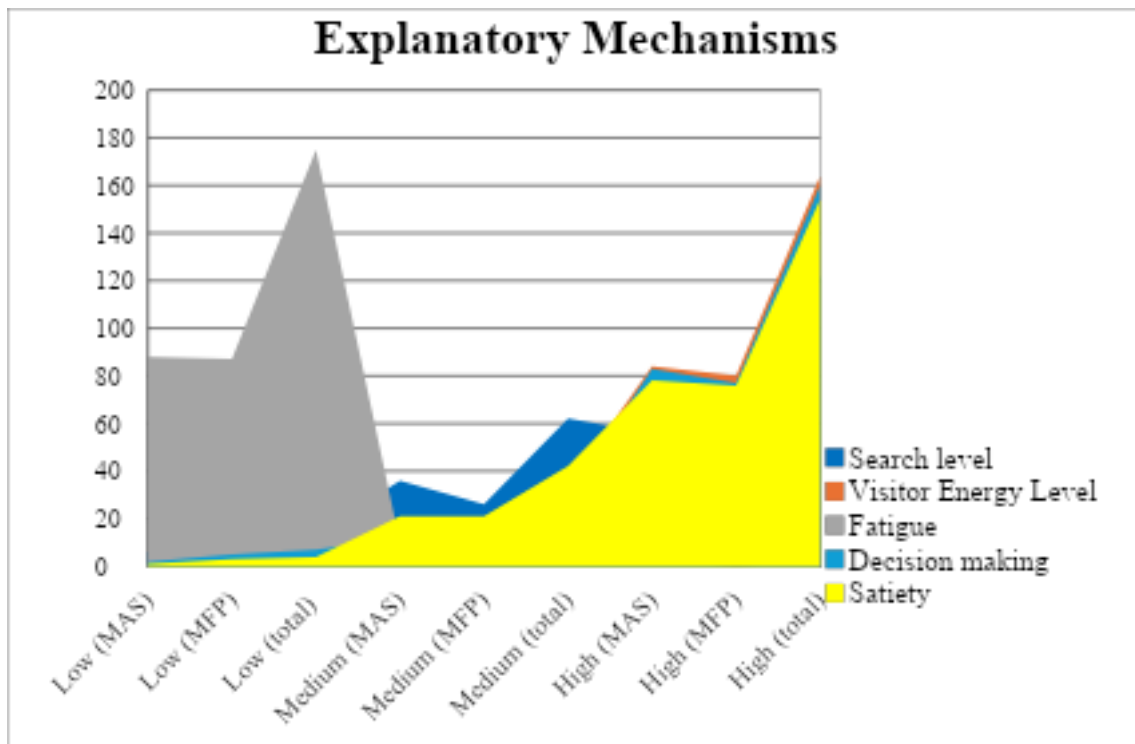
The Decision-Making mechanism helps explain how attention is directed toward options that are judged to offer perceived value and benefits. This stage examines which features of the exhibition draw attention and whether the visitor decides to engage with them. The empirical evidence suggests that this mechanism worked well in both museums. At the MFP, 77 visitors, and at the MAS, 83 visitors showed strong decision-making capacity by actively choosing exhibits that matched their interests. At the MFP, 18 visitors showed moderate decision-making, and 5 showed low decision-making. At the MAS, 12 visitors showed moderate decision-making, and 2 showed low decision-making. Instances of reduced decision-making capacity did not occur at random. They were linked to contextual conditions, including fatigue, satiety, and social conditioning (e.g. with companions setting the pace of the visit) and with museum staff influencing how the visit is guided through institutional mediation. These results support the view that decision making is not a stand-alone cognitive act; it is a relational process shaped by both individual factors and features of the surrounding environment or setting.

Satiety provides a clear explanation for why earlier analyses found a gap between a strong tendency to explore and relatively low levels of engagement. Bitgood (2013) defines satiation as a drop in interest that occurs when a person is exposed to the same or very similar stimuli repeatedly, making continued attention feel more costly. Most visitors reported high satisfaction: 76 at the MFP and 78 at the MAS. Moderate satisfaction was reported by 21 visitors in each museum. Low satisfaction was uncommon, reported by three visitors at the MFP and one at the MAS. These figures suggest generally positive experiences, yet from an analytical standpoint, high satisfaction does not always mean high engagement. It may point to affective closure, where visitors feel satisfied but are no longer inclined to spend more mental effort.

This interpretation accounts for why engagement stayed limited in several exhibition wings, especially at the MAS, even when Energy Levels were high, Fatigue was low, and

Search and Decision-Making processes were strong. Repeating similar statuettes across several wings likely increased satiation, reduced attention to differences, and led to earlier disengagement. In this context, satiation acts as a factor that limits attention and engagement, even when psychophysiological conditions would otherwise support sustained engagement.

Graph 3: Degree of explanatory Mechanisms at the MFP and MAS



Sources: Elaborated by the authors, 2024.

The statistical results align with Bitgood's (2013) argument that visitor engagement depends not only on willingness or ability, but also on how exhibitions shape attention demands and perceived value. The data indicate that visitors were physically and mentally ready to take part, but repeated exhibition content led to fatigue and reduced the shift from initial attention to sustained engagement. In this view, explanatory mechanisms do not work on their own; they form an interdependent system that links exhibition design to communicative performance.

Inferred Outcomes

The results from both museums suggest that visitors moved between mindful and mindless states as they engaged with the exhibitions, consistent with Moscardo's (1999) account. These cognitive states are not mutually exclusive; they vary by context and can shift over time as exhibition design, attention demands, and individual predispositions shape how

visitors respond. The distribution of observed cognitive states shows this contrast. At MFP, 51 instances of mindfulness and 48 of mindlessness were recorded. At the MAS, there were 58 instances of mindfulness and 39 of mindlessness. A few cases were ambiguous, one at the MFP and three at the MAS, which suggests that these states can shift and that it is not always possible to classify visitor cognition as strictly mindful or mindless.

From a theoretical standpoint, the near-even split between mindfulness and mindlessness implies that exhibitions can attract visitors' attention, but they may struggle to sustain cognitive engagement for the full duration of the visit. Moscardo (1999) argues that mindfulness involves active processing of information that supports learning and making meaning, while mindlessness refers to routine, automatic engagement that stays at a shallow level. At the MAS, mindfulness appears 58 times compared with 39 instances of mindlessness, which suggests a modestly greater scope for reflective engagement. This difference by itself does not indicate consistently sustained attention or engagement, as earlier impact-response analyses also suggest.

Mindfulness can support learning and knowledge acquisition in exhibitions by helping visitors stay attentive, become absorbed in what they see and do, enter a state of flow, and interpret the material in ways that match the exhibition's objectives. This aligns with Screven (1999), who argues that sound exhibition design supports meaning-making by steering how visitors interpret what they see and by strengthening the perceived value of the material. In this study, mindful engagement often reflected visitors' capacity to link exhibition narratives with prior knowledge or personal experience, which supports Bitgood's (2013) view that people build value through relationships and over time.

This process is supported by observed content retrieval behaviors, with 37 instances recorded at the MFP and 32 at the MAS. In this context, content retrieval, defined as recalling past experiences, information, or cultural references prompted by the exhibition, can be used as an indicator of cognitive engagement and the viewer's sense that the material is relevant. From an Attention-Value view, this kind of retrieval suggests that attention has moved from initial capture and focus to deeper engagement, where visitors actively link new information to their existing cognitive frameworks. These acts of recall can make the visit feel more meaningful and can raise visitors perceived value of the exhibition experience (Bitgood, 2013).

The data indicate that mindlessness is not always associated with negative visitor experiences. Even when visitors showed limited attention, interpretation, or learning, many still rated their experiences as positive. This apparent paradox points to an important theoretical

difference between affective satisfaction and cognitive engagement. Mindful attention can support learning and the formation of values, yet less attentive engagement can still be enjoyable, calming, or aesthetically rewarding, especially during leisure-focused visits. These experiences often lead to shallower learning and less lasting gains in both knowledge acquisition and meaning-making.

Reports of fatigue help clarify the processes that limit attention and shape perceived value. At the MFP, six visitors reported mental fatigue and linked it to long text passages, poor font color contrast, low lighting, and the panel for the Tapajônico collection. Eight visitors reported limited guidance or signage, and four described the content as overwhelming or repetitive. These factors are consistent with Bitgood's (2013) attention rules, especially the stop-looking rule, which states that visitors disengage when the effort they expect to invest seems greater than the benefit they expect to gain. A weak layout, too much text on the exhibition, and limited visual hierarchy raise cognitive load, which can reduce attention and engagement and lower perceived value (Bitgood, 2013).

At the MAS, fatigue was reported infrequently. Only three cases explicitly described physical exhaustion, linked to climbing stairs, breathing difficulties, and the building's acoustics. Design-related issues were more prominent. In total, 29 visitors reported a lack of guidance or signage, which suggests weaknesses in spatial layout and information planning, consistent with Screven (1999) and Bitgood (2013). Nine visitors reported that repeated material and too much information were problematic, which supports the view that satiety can limit attention. Bitgood (2013) argues that repeated stimuli lose novelty, which leads people to disengage sooner because sustaining attention starts to feel less worthwhile.

Overall, the inferred outcomes suggest that visitors in both museums generally reported positive experiences, but the level of cognitive depth varied across cases. The findings suggest that many visitors engage with the exhibitions through mindfulness and active recall of content, which supports sense-making and perceived value, but mindlessness, fatigue, and satiation reduce the exhibitions' overall communicative impact. These results support the view that positive effect on its own does not guarantee learning or sustained engagement. Exhibitions should instead treat visitor attention as a limited resource and plan for its costs. This requires managing variation in what is shown and providing clear interpretive guidance so that visitors can remain attentive and reflective, while still finding the visit valuable across different backgrounds, interests, and levels of prior knowledge.

Value of Exhibitions: Perceived Value, Attention, and Contextual Meaning-Making

An analysis of exhibition value in the two museums suggests that visitors' perceived value depends on how their existing interests and personal experiences combine with how easily the exhibition's elements draw and hold their attention. Consistent with the Attention–Value Model (Bitgood, 2013), value should not be treated as an inherent property of an object. Instead, it arises from the relation between the object and the person, shaped by familiarity, perceived relevance, and expected reward relative to the mental effort needed to engage with it.

At the MFP, visitors' learning and their perceived value were mainly linked to collections about ancient and traditional peoples. Of the 100 visitors interviewed, 96% reported interest and learning related to these collections, with particular attention to the Marajoara urns and the Muiraquitã. The concentration of responses suggests that objects with clear cultural symbols and regional identity served as high-value cues, drawing attention and increasing engagement because they matched participants' cultural meanings. From a theoretical view, this pattern is consistent with Bitgood's (2013) claim that when people see objects as unique or culturally important, they perceive paying attention as less costly and assign greater value to those objects.

In the visitor survey, 36% reported interest in objects from the Portuguese Wing, with the strongest interest in the replica of the painting Conquest of the Amazon and the coins. These data indicate that historical narratives tied to colonial identity also created value, though to a smaller degree. Only about 4% or 5% of visitors said they were interested in the museum's structure, conservation work, or written materials. This suggests that design features and interpretive supports were not central to what visitors openly described as valuable, even though they likely shaped where visitors focused and how they experienced the museum, consistent with Screven (1999) and Bitgood (2013).

When asked what they found less interesting, 64% of visitors reported that there was nothing they considered uninteresting or that they could not name any negative aspect. Overall, the result indicates that visitors felt positive about the visit, yet their engagement was not consistent across all parts of the exhibition. Differences in how visitors valued the material were clear. In the survey, 16% found indigenous-related objects less interesting, especially the polished stones shown at the start of the exhibition. Another 12% expressed less interest in Portuguese-related content, including European utensils and the accompanying information. A further 8% reported that the exhibition's structure and access limitations, such as dense texts, specialized terms, limited technology, and physical barriers, reduced its perceived value. These

responses suggest that rising cognitive costs can lead people to withdraw attention, which aligns with Bitgood's (2013) attention rules linking effort to perceived reward.

Visitors to the MFP tended to look for material that matched their own themes and expectations, which aligns with the Contextual Model of Learning (Falk, Dierking, 2012) and its view that personal and sociocultural contexts shape how people make meaning. Design features were rarely cited as benefits, but they were noted when they made tasks harder or information less clear. In these cases, design issues shaped how participants judged the value of the experience.

At the MAS, visitors' perceived value centered mainly on the dominant type of collection, with other collection areas receiving less attention in their evaluations. In the visitor survey, 66% reported that statuettes and images of saints were the most interesting features, with particular interest in the statuette of Our Lady of Mercy and the image of the Dead Lord. This pattern suggests that visitors recognized the exhibition's main theme early on and directed their attention to it. Interest in silverware items was reported by 17% of visitors, while 11% reported interest in paintings. The remaining 6% addressed issues such as infrastructure, the object's history, the garden view, or the church choir.

When asked about less engaging aspects of the visit, 74% of respondents reported no dissatisfaction or were unable to name a specific negative point. In contrast, 9% described the text as uninteresting, while 5% reported low interest in silverware and 3% in the paintings. A further 3% attributed their lack of interest to poor lighting and low color contrast, which diverted their attention. This interpretation is supported by systematic observations and qualitative responses collected during the fieldwork. Visitors frequently stopped at thematically coherent wings but often moved quickly through sections with extensive texts and repetitive displays. Together, these findings, combined with the attention indicators, suggest that thematic coherence successfully captured visitors' attention, whereas exhibition design limitations constrained sustained engagement.

From an analytical point of view, the MAS exhibition mainly encourages passive, focused attention in Screven's (1999) terms. This approach supports visitors in noticing and valuing the objects, but it does not strongly prompt more detailed interpretation or extended engagement. The collection's perceived value is mainly tied to economic, time-based, or material features such as age, rarity, and craftsmanship, rather than to symbolic meaning or narrative depth. This interpretation is supported not only by the quantitative findings but also by visitors' open-ended responses. Many participants described the collections using

expressions related to rarity, age, craftsmanship, precious materials, and historical preservation, while relatively few explicitly referred to broader symbolic or cultural meanings. These qualitative descriptions indicate that visitors primarily attributed value to tangible characteristics of the objects, reinforcing the interpretation derived from the descriptive statistics. This fits Bitgood's (2013) distinction between surface-level appreciation that draws initial attention and value that is formed through engagement and sustained attention.

Across the two museums, visitors were more likely to assign value to particular objects when they already knew something about them and when the objects related to their own experiences or interests. As Bitgood (2013) argues, when a stimulus is easy to detect and identify, it is more likely to receive attention and to be assigned value. This pattern is supported by empirical evidence from visitors' accounts that refer to their personal interests and prior life experiences. For instance, a set of coins in the Portuguese Wing of the MFP drew the attention of a visitor who collected coins, and the visitor discussed the display with a companion. One visitor related the exhibition material to memories from school. A tourist from the city of Natal focused on the historical links between Belém and his hometown and photographed the written texts to read later. With training in architectural history, he paid close attention to the museum's structural design and the preserved original flooring. These accounts were consistent with observational records showing longer viewing times, more frequent reading of interpretive materials, and repeated interactions with these displays. Together, these findings indicate that personal relevance plays a central role in sustaining attention and enhancing the perceived value of museum experiences.

Comparable processes were also observed at the MAS. A researcher reported strong interest in the urban layout of Belém shown in the Text Wing, with specific attention to how churches are distributed across the area. A professor of Portuguese, whose doctoral work examined the Jesuits, reported a high level of emotional and intellectual engagement with the section on this religious order. The account suggests that prior knowledge and personal relevance can increase the perceived value of the material and support sustained engagement.

In sum, the results support a core claim of the Attention–Value Model: museum visitors tend to spend more attention and effort when exhibition content aligns with their interests, personal memories, or sense of identity, which can increase the reward they expect even when the time cost is high. When visitors link exhibition objects to their own life experiences, they tend to learn more deeply and assign greater value to what they encounter. When exhibitions depend on repeated material, dense writing, or dull design, visitors tend to feel that

understanding the display takes more effort and offers less value, even when the collection is historically or economically important.

CONCLUSION

This study used Bitgood's Attention-Value Model to examine how tourists and other visitors engage with the long-term exhibitions at the MFP and at the MAS. It examines attention patterns, how visitors form value judgments, and how communicative performance works in these museum settings. The results indicate that both institutions are key to preserving Belém's cultural and historical heritage, and visitors generally view them in a positive way. Their exhibitions have only limited success in turning this heritage into lasting public interest and clear learning outcomes.

From a design standpoint, both museums showed a moderate level of overall performance. This suggests that the settings were sufficient to draw attention, but they did not strongly support the shift from initial focus to sustained engagement. Visitors entered the exhibitions with high energy and a clear intent to explore, yet sustained cognitive engagement was limited to a small share of the collections: 14.2% at the MFP and 8% at the MAS. These figures point to a structural gap between drawing attention and keeping it over time, supporting Bitgood's (2013) view that sustained engagement, not the first moment of notice, determines how well museums communicate.

Group dynamics also shaped how attention shifted over time. In small groups, participants were more likely to keep a consistent pace and attend to the same task, whereas larger groups often split into subgroups, which interrupted navigation and reduced continuity of attention. This pattern supports the importance of the Good Navigation design factor, as crowded spaces or unclear guidance can raise cognitive load and reduce visitors' ability to maintain attention.

In contrast to what was expected, fatigue did not appear to be the main factor limiting performance. Low engagement was mainly linked to satiety and the exhibition's repetitive structure. Wings with a wider range of objects, such as the Portuguese Wing at the MFP and the Silverware Wing at the MAS, drew higher visitor engagement even when the design was weak, suggesting that variety and clear distinctions among items can partly make up for limited interpretive support.

At a theoretical level, this study extends the Attention-Value Model by providing empirical evidence that motivational predispositions, object familiarity, and variation in exhibition settings work together to influence attention outcomes. The results clarify how value relates to attention, when visitors perceive higher value, they invest more attention, while low perceived value limits engagement even if visitors still report affective satisfaction. The study examined the link between mindlessness and low perceived value, but the available data did not allow a clear conclusion about whether visitors who report low value should be classified as mindless. This gap points to a specific question that future research should address.

Engagement was consistently observed as holding power, reflected in participants' tendency to keep thinking about the content after viewing it. This supports the idea that holding power is a valid empirical measure of engagement and that it can be used as a diagnostic measure in exhibition evaluation.

This study makes a theoretical contribution by defining measurable parts of the Attention-Value Model in an operating museum setting. It also provides empirical evidence on the processes that link attention to perceived value. The results indicate that exhibition design and visitors' own meaning-making both shape how much value they report. The study offers an analytical framework that can be applied to other museums in Belém and to similar cultural institutions.

The study's findings have practical implications for museum planning and exhibition design. First, museums could move away from approaches that focus mainly on capturing attention and instead invest in ways to sustain visitor engagement, such as a wider range of object types, interpretation that works at more than one level, and multisensory elements. Second, the consistently low scores for Prompting and Stimulus indicate a need for more flexible interpretive support. Shorter and clearer texts, along with audio guides, videos, QR codes, and interactive digital materials, may help visitors sustain attention without adding to cognitive load. Third, exhibition designs should allow for different group sizes to reduce crowd-related splitting and support a shared pace through space. Museums should treat visitors' personal backgrounds and situations as central to how value is formed and should use interpretive approaches that encourage comparison and reflection. When exhibition design follows established principles of attention, museums can communicate more clearly, support learning, and increase how visitors value their collections.

This study contributes to museum communication and visitor engagement research by extending the empirical application of the Attention-Value Model to the Brazilian museum

context, particularly, in the Amazon region. The findings demonstrate that visitor engagement depends not only on exhibition design but also on the interaction among attention, perceived value, visitor motivation, and the symbolic meaning attributed to museum objects. Methodologically, the study integrates systematic observation, visitor questionnaires, and qualitative analysis to operationalize the stages of capture, focus, and engagement, providing a replicable framework for evaluating visitor experience. Furthermore, the results show that objects perceived as historically and culturally significant are more likely to sustain visitors' attention, offering practical insights for exhibition planning and the development of visitor-centered museum communication strategies.

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