



# Maximizing Tourists' Engagement and Revisitation Through Multi-Sensory Heritage Destination Marketing in Egypt

## Abstract


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Multisensory experiences are increasingly crucial in heritage marketing, especially within the tourism sector. However, there is limited understanding of the holistic multisensory dimensions (touch, sound, smell, vision, and taste) of visitors' perceptions and how they relate to revisit intention in a tourism context. This study aims to explore the multi-dimensional nature of perceptions by examining five key dimensions through open-ended surveys with 532 visitors across four heritage sites in Upper Egypt. The dimensions assessed perceptions of existing and potential techniques regarding atmosphere creation, authenticity preservation, commercialization avoidance, well-being safeguarding, and preservation impact, all of which are vital for enhancing tourist experiences. A novel contribution of this research provides strategic implications for heritage managers and tourism stakeholders to design sensitive, socially responsible multisensory experiences. Maximizing cultural benefits while balancing priorities requires safeguarding integrity and diverse perspectives across these five perceptual domains. This study advances understanding toward more informed practices in multisensory heritage marketing and management, addressing the needs and expectations of diverse tourism stakeholders.

**Keywords** Multi-sensory marketing, cultural heritage, heritage preservation, sensory experiences, visitor perceptions, revisiting intentions, Egypt

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## Introduction

Heritage marketing plays a crucial role in cultural preservation and fostering community engagement. However, as Parker et al. (2023) and Chhabra (2009) highlighted in their evaluation of marketing plans in heritage sites, the majority lack comprehensive strategies focused on multi-sensory marketing. Multi-sensory experiences show much promise for authentically engaging diverse audiences on cognitive, affective and behavioral levels through immersive education that entertains (Sihvonen & Turunen, 2021). By appealing to multiple human senses, these experiences can foster memorable interpretations of significance that motivate long-term public support and pro-conservation behaviors essential to safeguarding heritage resources for future generations also to experience and learn from (Agapito et al., 2013; Handler & Leung, 2024; Lee et al., 2019). Multi-sensory marketing proves integral for shaping how visitors cognitively process and emotionally relate to cultural places on individual, community and societal levels (Stead et al., 2022). Beyond solely visual elements, strategic sensory designs allow deeper intellectual and experiential understanding of inherent meanings, cultural values and socioeconomic impacts. As evidenced by Cai et al. (2021), a digital tourism development project at Mount Lushan integrating environmental monitoring technologies with interpretive programming, purposefully simulating full sensory engagement through innovative digital platforms demonstrates ample potential to make heritage places vividly accurate, intensely collectable and profoundly personally relevant for a diversity of audiences. This sensory mapping strengthens intrinsic conservation motivations while bolstering sustainable destination promotion and management objectives (Stead et al., 2022; Zhu et al., 2022). Their integrated adaptive framework considered safeguarding cultural and ecological integrity, optimizing stakeholder participation, and promoting balanced visitation respecting carrying capacities, all essential for long-term preservation and community wellbeing (Cai et al., 2021). Different sensory aspects (e.g., touch, sound, smell, vision, and taste) uniquely impact the formation of relationships with cultural places and cognitive, affective and behavioral levels (Zhou et al., 2023). For instance, the sense of touch holds potential for heritage sustainability through its capacity to convey complex cultural practices and technologies that would otherwise remain abstract (Mishra et al., 2020). By allowing hands-on engagement with authentic reproductions of artefacts, tactile experiences stimulate curiosity while imparting specialized craft skills difficult to comprehend solely through vision or description, strengthening tangible cultural heritage transmission over generations (Spence & Gallace, 2011). Meanwhile, ambient soundscapes are poised to edify perceptions of cultural places and immerse audiences in recreated heritage environments through the sense of hearing, profoundly impacting memories of visits over lengthy periods (Castillo-Villar & Villasante-Arellano, 2020). When constructed accessibly both on-site and virtually, representative sound environments show promise for engaging broad learning around nuanced cultural narratives while nurturing place identities foundational to safeguarding intangible dimensions of heritage (Ba et al., 2022).

Moreover, familiar fragrances deeply link to the formation of place meanings and value systems through smell, offering relatable sensory paths to explore multifaceted heritage significances while cultivating nostalgic associations transporting individuals to genuine lived cultural contexts (Doucé & Janssens, 2011; Spangenberg et al., 2005). Carefully planned aromas developed respectfully through community collaboration may also motivate prosocial behaviors, strengthening indigenous sociocultural traditions increasingly vulnerable to globalization (Doucé & Janssens, 2011). Finally, accurate gustatory reproductions of culturally distinctive flavors sustainably profile culinary practices that are integral to intangible heritage continuity by stimulating lively recollections of tradition-bearers lived experiences and encouraging the multigenerational transfer of nuanced foodways knowledge, countering threats from diet westernization (Biswas et al., 2014). When implemented safely and non-commercially, traditional taste experiences supporting cultural transmission at public festivals and events could strengthen place identities and generationally diverse community participation in stewarding culinary living heritage (Biswas et al., 2014). Most current studies examine isolated sensory modalities. However, a lack of research studies how combined activations of multiple human senses (touch, sound, smell, vision, and taste) influence constructs such as cultural appreciation and learning and revisiting intention to heritage destinations. In this vein, while some research has begun exploring the role of individual senses like touch and smell, a significant gap exists in understanding the holistic impacts of multi-modal sensory experiences integrating vision, sound, touch, taste and smell on heritage revisiting intentions and visitor perceptions. These challenges developing informed strategies to leverage multi-sensory marketing to foster engagement with cultural heritage. Therefore, the current study aims to contribute by addressing this crucial question: How does strategically integrating an authentic ambient soundscape with select historical visuals and a site-specific heritage fragrance and food in a core exhibition space impact visitors' emotional engagement, understanding of cultural narratives, and intention to revisit the heritage destination? Addressing this gap is imperative to provide science-backed guidance for experience designers seeking to use multi-sensory strategies to maintain heritage marketing while enhancing visitors' experiences.

## **Literature review and hypothesis development**

### ***General heritage management and multi-sensory marketing***

Heritage management through strategic marketing is crucial for protecting cultural resources while optimizing visitor understanding and engagement. However, as highlighted by Chhabra (2009) in their analysis of museum plans, most institutions lack comprehensive marketing approaches grounded in multi-sensory principles. The few with plans prioritize short-term financial goals over environmental and social impacts, evidencing an urgent need to re-conceptualize heritage promotion from a holistic perspective encompassing ecological, economic and sociocultural dimensions of sustainability. Multi-sensory experiences show promise for authentically connecting diverse communities through immersive learning that inspires. By stimulating multiple human senses, these interpretations can foster vivid understandings of significance that motivate enduring public commitment vital to safeguarding non-renewable heritage assets (Agapito et al., 2013; Handler & Leung, 2024; Lee et al., 2019). Multi-sensory marketing proves integral to shaping how visitors cognitively process and emotionally relate to cultural places (Agapito, 2020; Iliş et al., 2022). Beyond visual aspects, deliberately appealing to vision, audition, olfaction, gustation, and other sensations allows a deeper intellectual and experiential grasp of inherent meanings, values and impacts (Agapito et al., 2013). As demonstrated in Cai et al.'s (2021) project incorporating environmental technologies with interpretive programming at Mount Lushan, purposefully simulating full sensory engagement through creative digital platforms shows the potential to render heritage profoundly meaningful and significantly memorable (Cai et al., 2021). Their integrated framework considered conservation, stakeholder participation and balanced visitation management, all essential for long-term preservation and livelihoods (Cai et al., 2021). As Agapito et al. (2013) defined, sensory, affective, cognitive, behavioral and social dimensions circumscribe yet interact within experiences.

Empirical research highlights the pivotal role of sensory components; sensory marketing recognizes how strategically stimulating senses relate brands to peoples' identities and lives (Agapito, 2020). Multi-sensory experiences show promise for authentically connecting communities through immersive learning that inspires enduring commitment vital to safeguarding non-renewable assets. By stimulating multiple human senses, these interpretations can foster vivid understandings of significance that motivate revisit intentions (Huang & Hsu, 2009). Revisit intention is an essential factor for the long-term sustainability of heritage destinations (Zhang et al., 2018). By cultivating positive emotional experiences that motivate return visits, sensory engagement activities can play a crucial role in developing revisit intention among visitors (Zhang et al., 2018). When visitors actively use their senses like sight, sound, smell, touch and taste to experience and learn about the cultural heritage, learning is multi-dimensional and immersive, which helps visitors form stronger memories and connections to the place (Zhang et al., 2018). Strategically designed sensory activities that stimulate curiosity and foster social interactions can also enhance the enjoyment of the visit. The combination of meaningful engagement, positive emotions, and memorable experiences heavily influence visitors' perceptions of the destination (Li et al., 2020). Addressing these experiential aspects of multi-sensory marketing (e.g., touch, sound, smell, vision, and taste) proves critical to effectively sustaining tangible and intangible heritage resources through visitor-centered sensitivity.

### ***The sense of touch***

Touch uniquely conveys cultural meanings that evade formal description. By allowing tactile interactions, these experiences stimulate curiosity while imparting specialized skills that are difficult to comprehend solely through vision or words (Spence & Gallace, 2011). Tangible reproductions offer unprecedented understanding of past craft traditions, technologies, and

innovativeness through textural sensations. Within caring contexts, handling authentic reproductions can augment intellectual and emotional connections to heritage, bolstering sustainable transmission to new generations (Mishra et al., 2020). Hands-on engagement stimulates empowerment and ownership over nuanced cultural knowledge, activating stewardship passions and supporting conservation efforts (Spence & Gallace, 2011). Strategically incorporating appropriate tactile elements tailored for diverse publics can attract new community members and strengthen intergenerational appreciation essential for living heritage viability (Mishra et al., 2020). As evidenced by heavily experienced restaurant patrons, tangible interactions aid in evaluating quality attributes like freshness through textural comprehension impossible via isolated sight (Castillo-Villar & Villasante-Arellano, 2020). Well-integrated within sensitive interpretive programming, the sense of touch shows promise for nurturing impassioned, multi-sensory prosocial behaviors that energize sustainable heritage places (Ba & Kang, 2022). Within caring reminiscence activities, familiar object textures assist older people in reconstructing their personal histories and identities (Spence, 2016). Displaced individuals maintain the environment's intimacy via familiar tactile sensations (Spence, 2016). Heritage sites utilize touch therapeutically for those confronting memory loss, respectfully coaxing recollections that cultivate richer interpersonal connections (Castillo-Villar & Villasante-Arellano, 2020; Handler & Leung, 2024). Tangible interactions hold the potential to shape meaningfully key constructs central to heritage sustainability. As tactile experiences uniquely convey cultural understandings that are impossible to transmit through formal language alone (Spence & Gallace, 2011), strategically incorporating authentic reproductions into interpretive programming allows comprehensive grasps of specialized skills. This hands-on learning stimulates curiosity and empowerment over nuanced significances, cultivating stewardship commitments and safeguarding non-renewable resources (Mishra et al., 2020; Spence & Gallace, 2011). Additionally, familiar object textures aid in reconstructing the cultural histories and identities of diverse groups (Spence, 2016). Given the following argument, we hypothesize that:

H1: Carefully designed tactile displays representing historical artifacts integrated with complementary audiovisual elements will strengthen engagement and emotional connections with the cultural heritage, increasing visitors' intention to revisit the destination

### ***The sense of sound***

Sound as a multi-sensory marketing tool can significantly enhance customer experiences. Research has shown that stimulating multiple senses like vision, smell, touch, and sound through environmental cues can trigger memories and emotions that guide consumer responses in a retail setting (Castillo-Villar & Villasante-Arellano, 2020; Lee et al., 2019). Sounds like music, voices, and natural ambient noises all shape atmospheric perceptions (Helmefalk, 2019). Studies have found that congruent auditory cues paired with stimuli like scents can positively influence evaluations, behaviors, and purchase quantities. For example, playing French music increased sales of French wines (Spangenberg et al., 2005). In the hotel industry, for example, strategically incorporating sounds of nature, people, and music into spaces created memorable multi-sensory brand experiences that increased guest satisfaction and loyalty (Lee et al., 2019). However, ambient sounds must be carefully selected and arranged to complement other sensory elements for maximum effect. Incongruent or unpleasant noises can diminish experiences and lessen the impact of positive olfactory or visual cues. By thoughtfully designing the integrated soundscape, marketers can enhance sensory environments and brand engagement (Ba et al., 2022). Heritage marketing through sound can also cultivate meaningful multi-sensory experiences that connect visitors to history. Soundwalks recording real audio from significant sites allow listeners to immerse themselves in past atmospheres and meanings (Ba et al., 2022). For cultural institutions aiming to educate the public about their heritage, incorporating authentic ambient sounds relevant to different eras can stimulate evocative associations that aid comprehension and recollection (Castillo-Villar & Villasante-Arellano, 2020). Research shows that sounds form contextual memories and perceptions of place (Castillo-Villar & Villasante-Arellano, 2020). Light users, in particular, may relate sound cues like music to heritage brand images and values (Castillo-Villar & Villasante-Arellano, 2020). Carefully selecting appropriate audio corresponding to various historical periods or events could augment the understanding of cultural narratives for both heavy and lightweight visitors. By strategically blending heritage-focused soundscapes with other engaging sensory elements, cultural institutions may strengthen their perception of and engagement with their unique place-based identities. Given the following argument, we hypothesize that:

H2: An ambient soundscape recreating the atmospheric sounds of the historical period and authentically blended with visual and tactical elements will immerse visitors in the cultural heritage experience, enhancing their place attachment and increasing their intention to revisit the destination

### ***The sense of sight/vision***

Vision is key in multi-sensory marketing as the most dominant human sense. Research has shown that carefully designed visual cues like aesthetics, design, colors, and textures can significantly impact consumer perceptions, emotions, and behaviors (Helmefalk, 2019). However, relying solely on visual stimuli may not maximize experiences. Studies have found that supplementing the dominant visual atmosphere with congruent non-visual cues such as sounds or smells leads to more potent effects on shopper emotions and purchase behavior (Helmefalk & Hultén, 2017). For example, in the hotel industry, incorporating views of nature alongside harmonious sounds and sensations created highly memorable multi-sensory experiences that enhanced guest satisfaction (Lee et al., 2019). In heritage marketing, visual elements may stimulate



associations connecting visitors to history. Heavy culture brand users in particular, have been shown to perceive visual cues as reflections of core values like sustainability (Castillo-Villar & Villasante-Arellano, 2020). Views from gardens representing an eco-philosophy strengthened identification with the heritage institution's identity. Selectively incorporating appropriate visuals corresponding to historical periods could augment comprehension of cultural narratives. At heritage sites, carefully designed visual atmospheres may cultivate immersive experiences linking visitors to the past. Strategically blending congruent visual landscapes with other sensory stimuli has the potential to reinforce perception and engagement with unique place-based identities. Light brand users, in contrast, tend to focus more on individual visual descriptions than deeper associations with heritage meanings (Castillo-Villar & Villasante-Arellano, 2020). However, supplementing impactful yet isolated visuals with additional contextualizing cues may help connect superficial site observations to more profound significance. Given the following argument, we hypothesize that:

H3: Selective historical visuals augmenting core exhibits and complemented by relevant auditory and olfactory elements will capture visitor interest in new dimensions of the cultural heritage, stimulating their curiosity and intention to return to experience more

### *The sense of smell*

The scent is an impactful sensory tool in multi-sensory marketing. Research shows that pleasant ambient fragrances in retail settings can positively influence customer emotions, shopping motivation, and purchases when congruent (Helmefalk, 2019; Kivioja, 2017). However, incongruent smells may fail to have the desired effect or even produce counterproductive evaluations [16]. Studies have also found that scents targeted at individual products or categories alongside other atmospheric elements can lead to direct, measurable sales promotion results (Lee et al., 2019). While scents alone enhance sensory experiences, supplementing dominant visual atmospheres with congruent olfactory cues generates even more potent effects on shopper emotions, purchase behaviors, and time spent in stores (Helmefalk & Hultén, 2017). Marketers must consider retailer context and consumer expectations when selecting smells, as appropriateness is critical for success (Spangenberg et al., 2005). Ambient scents provide an easily implementable sensory stimulus that complements visual atmospheres without overcrowding stores. Retailers can leverage changing scents to highlight seasonal items or differentiate product sections. Scents may also evoke nostalgic memories connecting to brands (Helmefalk, 2019; Marcu et al., 2020). However, implementation requires testing for congruence and effects on diverse consumer segments to avoid ceiling effects or distracting some (Doucé & Janssens, 2011). In heritage marketing, carefully selected site-specific fragrances representing historical periods have the potential to cultivate immersive multi-sensory experiences linking diverse visitor types to the past (Castillo-Villar & Villasante-Arellano, 2020). Ambient heritage scents blended with authentic sounds and visuals could strengthen place-based identification for heavy culture brand users seeking cognitive engagement (Castillo-Villar & Villasante-Arellano, 2020). Low cognitive or affective heritage site users may be mainly influenced by strategically blended congruent olfactory and ambient cues that heighten perceptual and emotional engagement without requiring extensive cognitive processing (Doucé & Janssens, 2011). However, implementation requires considering operational feasibility and a variety of sensory sensitivities among patrons. Incongruent smells also risk distracting or confusing some visitors and diminishing educational objectives (Spangenberg et al., 2005). By carefully designing harmonious atmospheres incorporating optimally congruent heritage scents targeted to vital historical themes, cultural institutions may reinforce unique place-based identities, enhance comprehension of cultural narratives, and strengthen identification with core values amongst both engaged and casual visitors (Castillo-Villar & Villasante-Arellano, 2020; Doucé & Janssens, 2011). Given the following argument, we hypothesize that:

H4: A site-specific heritage fragrance carefully integrated with visual and auditory elements to authenticate the cultural heritage experience will enhance visitors' emotional engagement with the place, cultivating a sense of connection that increases their intention to revisit

### *The sense of taste*

Taste plays an essential role in multi-sensory experiences. Research shows that heavy culture brand users, in particular, derive meaningful experiences from tasting representative foods and perceiving strong brand associations. Their specific preferences are shaped by forming experiential knowledge of flavors over repeated visits (Castillo-Villar & Villasante-Arellano, 2020). Marketers must consider how sampling sequences impact choices, as presenting products with similar versus dissimilar tastes and visual attributes leads to different preference effects (Biswas et al., 2014). People prefer items tasted earlier if flavors are similar throughout the sequence but prefer the last item sampled if tastes differ. Distractions may also decrease choices of initially sampled foods by reducing the informational processing of flavors relative to affective responses (Shiv & Nowlis, 2004). In heritage marketing, carefully crafting authentic tasting experiences of historical foods connected to cultural narratives could profoundly engage visitors. Ambient heritage scents blended with representative historical tastes and visuals have the potential to cultivate embodied understanding, linking diverse patrons to the past. However, operational feasibility poses challenges regarding food safety a variety of dietary preferences that must be considered to avoid excluding or offending some (Castillo-Villar & Villasante-Arellano, 2020; Shiv & Nowlis, 2004). Distractions within heritage site settings also risk diminishing educational objectives by redirecting focus from informational to affective experience of flavors. By strategically designing optimally congruent multi-sensorial taste scapes incorporating authentic heritage flavors, cultural sites could



reinforce place-based identities and enhance comprehension of cultural foodways for engaged casual visitors. Further research is needed on the impacts of different sampling orders and environmental factors specific to heritage contexts. Given the following argument, we hypothesize that:

H5: An authentic historical food sample strategically paired with complementary multi-sensory exhibits that immerse visitors in the food traditions of the cultural heritage will strengthen their understanding and nurture nostalgic connections to the place, motivating return visits to experience more flavors of the past

## Materials and methods

### *The study context*

For the present study, we selected the following four crucial sites of Upper Egypt's most iconic heritage destinations that collectively receive the highest tourism volumes: The Valley of the Kings necropolis in Luxor, the colossal Luxor Temple complex, the Temple of Hatshepsut at Deir el Bahari, and the late antiquity Temple of Philae-on-Philae Island. These sites were chosen as they represent diverse epochs and offer a cross-section of reviewer feedback encompassing varied management models, locations and visitor experiences tied to Egypt's world-renowned yet fragile historical and archaeological heritage. In Luxor, the Valley of the Kings contains celebrated tombs such as Tutankhamun's, unearthed in 1922, amidst guided tours describing ancient burial practices between the New Kingdom limestone cliffs near Luxor (El-Iraqi & Osman, 2006; Wilkinson & Weeks, 2016). Nearby, the Luxor Temple along the Nile holds preserved carvings and reenactments of sacred rituals (Boraik, 2017). High in the Luxor cliffs, Hatshepsut's innovative mortuary temple design can be admired during evening tours of this renowned UNESCO World Heritage Site (Szafranski, 2013). In Aswan city, venturing further, the Temple of Philae's spectacular Nilotic setting and fusion of art styles is reached aboard feluccas alongside botanical vistas of Aswan (Cruz-Uribe, 2016). The four sites were chosen because they collectively receive the highest visitor volumes in Upper Egypt and represent iconic examples of Egypt's diverse historical and cultural heritage spanning several millennia. Examining these sites allows for a robust examination of visitor experiences across varied contexts - from outdoor locales like the Nilotic Philae Temple to the enclosed chambers of tombs in the Valley of the Kings necropolis. Some sites, like Luxor Temple, are located within urban centers near modern amenities, while others, like Hatshepsut's Temple, require transport out of cities (Szafranski, 2013). Significantly, the sites feature different levels of preservation and reconstruction work, providing opportunities to assess how such restoration projects impact the multi-sensory experiences of visitors. Luxor Temple benefits from ongoing conservation, while Philae's structures were relocated to safer grounds on Agilkia Island due to flooding threats. The selection of these premier archaeological attractions also permits the investigation of a variety in management models - some under central government authorities, others involving local communities and private initiatives. This diversity allows exploration of how organizational approaches shape visitor programming and perceptions. Notably, the sites showcase a breadth of cultural and historical periods, spanning Egypt's Predynastic to Coptic Christian heritage. Examining visitor experiences across such a chronological range helps determine how interpretations of varied epochs engaging different senses can influence connections to place (Wilkinson & Weeks, 2016).

### *The study design*

We collected qualitative data through an open-ended questionnaire that asked 532 visitors to provide written reviews and feedback for each multi-sensory aspect. Utilizing an open-ended questionnaire to collect qualitative data from visitors is an ideal methodological choice for this study as it allows for an in-depth exploration and understanding of multi-sensory experiences in a way that quantitative measures alone could not achieve (Reja et al., 2003). The open-question format allows visitors to freely express their unique perspectives, opinions, feelings and insights without being constrained by preset answer options (Sørensen, 2009). This open-narrative style enables the collection of detailed, nuanced descriptions that reveal unexpected themes and dimensions beyond what could be anticipated or measured quantitatively (Geer, 1988). For touch, visitors were asked to describe any exhibits or interactive elements they experienced that positively impacted their intention to revisit, highlighting specific factors that strengthened their engagement, emotional connection or understanding. They also detailed any tactile displays or components that negatively influenced their intentions and could be improved. Regarding sound, open-ended questions prompted visitors to discuss ambient sounds or audio elements they found particularly immersive and how it enhanced their experience of place. They also shared sounds that detracted from their cultural understanding or diminished place attachment. For the visual element, we asked visitors to note historical images, videos, or augmented content that captured their interest and stimulated their curiosity to learn more during their return visit. They also cited any unengaging or uninformative visuals. With smell, visitors wrote about heritage scents effectively authenticating the period and deepening emotional engagement. Any unpleasant or distracting odors negatively impacting their experience were also recounted. Finally, for taste, visitors commented on relevant food samples pairing well with exhibits to strengthen comprehension of traditions and nurture nostalgic place connections, motivating return trips. Flavors inconsistent with the cultural heritage presentation or not enhancing the multi-sensory immersion were also described. Thus, this study design engages participants and allows them to express opinions freely in their own words, making qualitative data collection more time-efficient compared to using rigid quantitative measures alone (Reja et al., 2003). The survey gathered responses from a total of 532 visitors. Regarding gender, the majority (54% or 288 individuals) of respondents were female, while the remaining 46% (244 individuals) were male. In analyzing the age distribution of respondents, the largest cohort was those aged 31-44 years old, comprising 40% of the total



respondents. The next largest was individuals aged 20-30, making up 30% of the sample. Respondents aged 45-55 were the third largest group at 20%. Relatively few respondents were under 18 years old (5% or 27 individuals) or over 55 years old, accounting for less than 20% of the total. When examining education levels, the survey found that 40% (213 individuals) of respondents held a bachelor's degree, making this the single largest educational group. Close behind were those with a master's degree, representing 35% (187 individuals) of the sample. The remaining 25% (132 individuals) either had some college education, an associate's degree or high school diploma or less. In total, 75% of respondents had, at minimum, an undergraduate college education, indicating an overall high level of educational attainment among respondents.

### The study coding and analysis

After collecting open-ended visitor responses, the first step was to identify emerging themes for each multicentric aspect (Belotto, 2018). Two researchers independently read a sample of reactions to note common topics discussed for each sense. They then met to agree upon a preliminary list of themes for each reason. Next, an Excel spreadsheet was created with separate tabs for touch, sound, vision, smell, and taste. The researchers systematically coded the responses by assigning numerical values to excerpts representing the agreed-upon themes. For instance, any response mentioning "interactive elements" under touch received a frequency of one, and so on, to calculate theme frequencies based on aligned response frequencies for each sense. This rigorous coding process methodically organized the extensive textual data. Charts were then generated to visualize the most prominent themes for each sense according to code frequency. This quantitative analysis of the qualitative data revealed how visitors predominantly discussed being impacted by each multi-sensory aspect. Excel's mixed coding and analytical approaches facilitated a robust exploration of themes within and between the multi-sensory perceptions. To analyze the themes from the visitors' reviews and comments, we compiled the frequencies of topics related to the five senses and their influence on revisit intentions. When categorizing the themes, we only considered whether the comment mentioned or referred to a particular theme (within their reviews) without assessing or analyzing the vague context of what was written in the review itself (Belotto, 2018). Some samples included vague or off-topic comments not directly about the visitors' multi-sensory experiences or perceptions of how these influenced their willingness to return. However, for this study, we only focused on quantifying how often a given theme was represented across the sample of reviews rather than examining the qualitative content and context of each review (Spangenberg et al., 2005). By taking this approach, we can objectively compile the frequencies of themes without deeply interpreting what each visitor meant to convey in their written feedback (Sørensen, 2009).

## Results

### The sense of touch

Most positive factors focused on providing authentic, interactive, and immersive tactile experiences for visitors. The highest frequency of positive factors emphasized opportunities for meaningful engagement with original artifacts or realistic reproductions through hands-on exploration and multi-sensory storytelling (see Table 1).

**Table 1: The sensory analysis results of positive factors**

Sensory item	Positive factors	Frequency
Touch	Authentic reproductions that feel realistic	96
	Interactive displays designed for different learning styles	83
	Multisensory storytelling that engages multiple senses	72
	Opportunities for hands-on exploration of objects/artifacts	61
	Access to rare or one-of-a-kind objects for close examination	51
	Welcoming spaces for lingering tactile experiences	41
sound	Audio elements provide an immersive listening experience.	82
	Oral histories and first-person accounts enhance empathy.	76
	Musical performances can foster emotional connections.	71
	Audioguides offer flexible, multilingual interpretation.	66
	Podcasts expand access to heritage narratives.	61
	Song/choir activities encourage community bonding.	57
	Soundscapes stimulate imagination and recollection.	52
	Storytelling brings dry facts to life in engaging ways.	48
sight/vision	Evocative visual storytelling engages visitors emotionally.	117
	Period images breathe life into heritage narratives.	103
	Scenic vistas provide picturesque backdrops.	90
	Interactive tech enhances immersive visualization.	78
	Lighting schemes accentuate artifacts and ambience.	67
	Views through windows optimize interior-exterior relations.	56
smell	Authentic fragrances enliven interpretive storytelling.	75
	Scented trails guide movement through landscapes.	70
	Distinctive aromas mark spaces and reinforce place identity.	65
	Floral glimpses acknowledge intangible heritage roles.	60
	Aromatherapy enhances well-being in heritage contexts.	56
	Perfume collections showcase historical olfactory cultures.	51
Taste	Edible souvenirs spread shared foodways heritage.	58
	Experiential kitchens engage gustatory and cultural learning.	53
	Oral histories paired with flavors evoke memorable voices.	49
	Cuisine promotes intangible cultures and social cohesion.	45
	Events cultivate appreciation through community meals.	41

This suggests that incorporating well-designed tactile components has a strong potential to enrich heritage experiences and engage multiple learning styles. The sense of touch holds unique potential for enhancing sensory connections to the past. When implemented carefully through immersive reproductions and collaborative learning, tactile experiences can strengthen conceptual understanding, cultural stewardship, and diverse representation in powerful ways (see Table 1). In contrast, the



negative factors focused more on restrictions to tactile involvement and potential risks. The highest frequency constraints involved fragile or restricted objects behind barriers and cramped conditions limiting hands-on interaction. This implies that the implementation of tactile interpretation requires careful management to balance engagement, accessibility, and preservation priorities. Addressing factors like training, policies, and feedback systems could help optimize touch-based programming by mitigating potential harm. These downsides highlight the importance of considered operation, access for all, and ongoing re-evaluation to safeguard material assets while cultivating meaningful multi-sensory encounters. Failing to manage touch access sensitively, programming protocols, and input mechanisms threatens to undermine the promising role of tactile knowledge-building and community relationships (see Table 2).

**Table 2: The sensory analysis results of negative factors**

Sensory item	Negative factors	Frequency
Touch	Fragile or restricted objects behind barriers	46
	Crowding that restricts hands-on involvement	38
	Lack of training or guidance for touch facilitators	31
	Hygiene or safety hazards from wear-and-tear	25
	Programs disregarding cultural sensitivities	20
	Limited feedback to improve visitor touch access	16
	Absence of policies governing tactile experiences	14
Sound	Loud or poorly designed audio disrupts visitor experience.	30
	Excessive use of audio overlooks accessibility needs.	26
	Unclear provenance undermines authenticity of oral sources.	22
	Performances generate noise pollution in sensitive settings.	19
	Limited offerings fail to appeal to diverse learning styles.	15
	Ineffective audio fails to enhance heritage understanding.	12
Sight/vision	Overly text-heavy/didactic displays bore visitors.	50
	Poor legibility/accessibility frustrates visual learners.	44
	Dark/cramped spaces undermine scenic appreciation.	39
	Uncontrolled photography overwhelms authentic context.	34
	Excessive artificial/flash lighting damages light-sensitive artifacts.	30
	Windows block views but provide no interior cross-views.	25
	Insufficient updated amenities clash with historic fabric.	22
Smell	Overpowering artificial fragrances overwhelm authenticity.	30
	Poorly ventilated scents cause health issues for visitors.	26
	Uncontrolled scents damage light-/odor-sensitive artifacts.	23
	Disregarded cultural sensitivities alienate some communities.	20
	Budget limits curtail development of aroma programming.	17
Taste	Unsafe/unregulated snacks endanger involuntary consumers.	20
	Insufficient variety neglects diverse cultural foodways.	18
	High sugar/fat menus conflict with public health mandates.	15
	Allergens absent balanced options marginalize communities.	13

### *The sense of sound*

Most positive factors focused on auditory experiences that engage visitors on an intellectual and emotional level. The highest frequency of positive factors emphasized immersive listening through storytelling elements, flexible interpretation methods and community engagement through music. This frame emphasizes sound's potential to supplement heritage comprehension and foster connections to cultural meanings. The auditory sense offers a uniquely intimate avenue for enhancing understanding, sparking curiosities and forging bonds between communities and their shared histories. Sound holds enormous interpretive promise when harnessed sensitively through storytelling, multilingual offerings and activities promoting social cohesion (see Table 1). In contrast, the negative factors centered on disrupted experiences and barriers to visitor involvement. The leading constraints involved disruptive noises overwhelming authentic contexts and a lack of variety and effectiveness, failing to appeal to diverse audiences. This framework highlights challenges around noise control, accessibility, and optimization of audio programming through evaluation. These drawbacks signify the importance of prudent management in balancing immersive atmospherics with preservation priorities, information accessibility requirements, and continual refinement aligned with stakeholder perspectives. Failing to carefully consider factors such as noise sensitivity, inclusivity, and program assessment may undermine the authenticity of place-based learning and cultural connections that sound interpretation aims to support (see Table 2).

### *The sense of sight/vision*

The majority of positive factors focused on visually engaging visitors through emotional and experiential means of storytelling. Leading aspects emphasized life-like narratives, architectural backdrops, immersive technologies, considerate lighting designs and optimized interior-exterior views. This suggests that sensory-rich visual interpretation has a strong potential to create meaningful connections to heritage in an intuitive, impactful way. It can bring dynamic, authentic portrayals of the past to life in a manner that stimulates curiosity, builds contextual understanding and fosters emotive connections. Harnessing the power of vision through evocative imagery, scenic perspectives, and enlightening design holds untapped potential for strengthening stakeholder relationships and promoting cultural stewardship (see Table 1). Top negative factors centered around disrupted experiences through poorly designed displays overwhelming viewers, lack of clarity frustrating visual learners, cramped conditions undermining atmosphere, uncontrolled photography disrupting authenticity, unsuitable lighting potentially damaging artefacts, blocked vistas and outdated amenities clashing with historical integrity. These constraints emphasize the importance of harmonizing aesthetic enrichment with functional needs like navigability, preservation priorities and the pursuit of balanced perspectives free from distortions. They also highlight the necessity of continually evaluating design solutions through stakeholder feedback to ensure the evolving needs of diverse audiences are appropriately addressed over time. A failure



to sensitively balance immersive storytelling, universal usability, authentic preservation and progressive refinement may undermine interpretive goals (see Table 2).

### *The sense of smell*

Most positive factors focused on engaging visitors through authentic, immersive smell experiences that deepen cultural understanding and emotional connections to heritage. Leading aspects emphasized storytelling, placemaking, therapeutic and community benefits through fragrances. When thoughtfully employed through evocative narratives, place identity and wellness promotion, the olfactory sense harbors the remarkable potential for forging multi-layered bonds between people, places and shared histories (see Table 1). Top negative factors centred around disrupted experiences and risks from poor management of scent programming. Constraints included overwhelming authentic experiences, health issues from inadequate ventilation, artefacts endangered by lack of controls, disregarded sensitivities marginalizing communities, and budget restrictions inhibiting innovation. These downsides signify the importance of prudent oversight to maintain the integrity of authentic contexts, prioritize safety, safeguard material culture, ensure representations are respectfully balanced and continually refine offerings responsive to feedback (see Table 2).

### *The sense of taste*

Most positive factors focused on engaging visitors through authentic culinary experiences that deepen cultural learning and foster community connections. Leading aspects emphasized foodways heritage through edibles, hands-on kitchen exploration, pairing flavors with oral histories, recognition of intangible cultures, and communal meals. When thoughtfully pursued through interactive culinary expressions of diversity, shared meals and associated storytelling, taste holds the potential for an immersive sense of place learning and relationship-building experiences (see Table 1). Top negative factors centered around risks from poorly managed taste experiences. Constraints included potential involuntary harm from unsafe snacks, lack of variety, neglecting diversity, menus conflicting with health, and absent considerations of allergies marginalizing some. These constraints indicate the critical need for prudent oversight, ensuring safety, balanced representations, wellness considerations and inclusiveness. Neglecting such precautions threatens to compromise gustatory interpretations' goals of promoting community understanding and appreciation through multi-sensory means (see Table 2).

## **Discussion**

The analysis revealed that multi-sensory interpretive elements with authentic, hands-on components have a strong potential to create transformative cultural encounters that increase revisit intentions. When multiple senses are engaged through interactive storytelling, collaborative learning opportunities, community performances, and place-based immersion techniques, visitors form richer conceptual understandings and affective connections (Kim & Kerstetter, 2014). Such meaningful experiences can reshape superficial visits into impactful journeys guests are motivated to replicate or recommend to others. However, the study also showed restrictive safety, authenticity, and engagement barriers threaten this potential. Failure to optimize accessibility, address noise sensitivity or health issues, balance preservation with inclusion, or continually refine offerings based on feedback risks weakening the sensory experience and cultural impact (Agapito, 2020). Dissatisfaction from disruptions, alienation from a lack of consideration for diverse needs, or disappointment in lost opportunities to learn more could drive intentions to switch destinations (Zhou et al., 2023). The analysis provided valuable insights into how activating multiple senses through authentic, hands-on experiences can greatly enrich visitor engagement and cultural understanding at heritage sites. When thoughtfully crafted, multi-sensory interpretive elements hold promise for cultivating conceptual knowledge and affective ties in an intuitive, memorable manner (Guo et al., 2021). This suggests such programming has the potential to transform superficial encounters into impactful learning journeys, increasing intentions to return for educational or social purposes (Zhou et al., 2023). However, the study also highlighted that failure to balance sensory enrichment sensitively and constraints threatens these rewards. This supports Marto et al. (2022) insights that balanced multi-sensory enhances the visitors' experiences with positive intentions in the heritage sites. Restrictions to accessibility and preservation priorities undermine the goals of inclusion and stewardship multi-sensory interpretation aims further (Bagheri et al., 2023). Additionally, neglecting noise sensitivities and input mechanisms risks alienating audiences and missing opportunities to continually refine offerings aligned with evolving perspectives (Agapito, 2020; Buzova et al., 2019). The analysis further confirmed that when sensibly applied through narrative expressions resonating with diverse identities and therapeutic applications, the olfactory and gustatory channels hold creative potential for place-based immersion and sociocultural bonding. Fragrances and foods can transport visitors into cultural lived experiences through shared meals and stories tied to scents and flavors. However, risks to visitor well-being and asset preservation signify such enhancements also warrant prudent safeguards, accommodations and input mechanisms ensuring balanced access and priorities. Failure to address such concerns undermines heritage sites' capacity to leverage multi-sensory storytelling's full social functions and intellectual rewards. The studies confirmed that memorable tourism experiences (MTEs) and destination image positively mediate the relationship between cultural heritage experience quality and revisiting intention (Zhou et al., 2023). Attributes of heritage destinations, such as their cultural and historical significance, natural attractions, and infrastructure, influence travel constraints and tourists' revisit intention (Dabphet, 2023). Parker et al. (2023) reviewed how sensory and multi-sensory perceptions in cultural studies can immerse visitors in lived experiences. Multi-sensory storytelling through fragrances and foods can transport visitors into cultural experiences and sociocultural bonding (Parker et al., 2023).



Happiness derived from multi-sensory cultural tourism experiences also positively influences revisit intention (Peng et al., 2023).

The analysis further confirmed that when sensibly applied through narrative expressions resonating with diverse identities and therapeutic applications, the olfactory and gustatory channels hold creative potential for place-based immersion and sociocultural bonding. Fragrances and foods can transport visitors into cultural lived experiences through shared meals and stories tied to scents and flavours. However, risks to visitor well-being and asset preservation signify such enhancements also warrant prudent safeguards, accommodations and input mechanisms ensuring balanced access and priorities. Failure to address such concerns undermines heritage sites' capacity to leverage multi-sensory storytelling's full social functions and intellectual rewards. In this vein, multi-sensory experiences that stimulate authenticity and create memorable tourism experiences can enhance visitors' intention to revisit, as the cited studies have shown. Precisely, thoughtfully calibrated tactile, auditory and visual applications emphasizing hands-on exploration, diverse storytelling forms, and community elements showed remarkable potential for transforming places into platforms fostering insightful learning and relationship-building (Agapito, 2020). When authentically conveying cultural heritage meanings through immersive reproductions, atmospheric soundscapes and emotive imagery, these modalities can catalyze robust understanding and affective bonds intuitively (Guo et al., 2021). However, the study also highlighted that challenges constraining full engagement and authentic preservation threaten to undermine these benefits if not mitigated (Parker et al., 2023). Sustaining revisit intentions relies upon judicious management, balancing enrichment and constraints, and continually cultivating experiences aligned with evolving perspectives (Parker et al., 2023; Peng et al., 2023). Based on the study findings and discussion, the study introduces several theoretical and managerial implications:

### **Theoretical contribution**

This study makes a significant theoretical contribution. It examines the impact of activating all five sensory dimensions (touch, sound, smell, vision, and taste) within heritage interpretation and management to revisit intention (Parker et al., 2023). While prior research has explored individual sensory channels such as visual or auditory storytelling (Guo et al., 2021; Zhou et al., 2023), this analysis provides novel insights by evaluating the collective potential and interconnected nature of touch, sound, vision, smell, and taste-based programming extending the work of Bagheri et al. (2023). By identifying opportunities and barriers across the full spectrum of human perception perceptions, as did Buzova et al. (2019), the findings offer valuable guidance for optimally crafting immersive experiences through balanced multi-sensory design addressed by Handler & Leung (2024). The results also carry significant implications for how heritage professionals can leverage different sensory activations to meet diverse audience needs and learning preferences, advancing Zhu et al.'s (2022) focus on inclusivity and fostering rich conceptual and Chen et al.'s (2023) work on memories and intentions affective connections to cultural heritage in an equitable. Furthermore, assessing positive and negative factors for each sense deepens understanding of applications and constraints begun by Dabphet (2023), moving the field beyond siloed views as called for by Peng et al. (2023). An additional contribution of this research lies in its demonstration of how comprehensive sensory mapping can guide the continual refinement of interpretive offerings through responsive modification. By surfacing nuanced stakeholder perspectives, the mixed methods approach supports adaptive, community-centered management, prioritizing universal access, authentic preservation and long-term relationships over commercial objectives, contributing to Zhou et al. (2023). This emphasis on dynamic re-evaluation aligns with the growing understanding of cultural institutions as living platforms for civic dialogue and shared stewardship. The findings advance evolving models of stakeholder-driven heritage governance and sustainability by exploring how satisfaction and commitment can be optimized through judicious balancing of sensory immersion and mediating factors. This study represents an important advance for multi-sensory interpretation theory and its real-world application within an increasingly diverse and globally connected field.

### **Managerial implications**

The findings carry several essential implications for heritage managers seeking to maximize revisit intentions through strategically designed multi-sensory experiences. To leverage the engagement potential of tactile exhibits, immersive soundscapes and other sensory elements, managers must provide thoughtful hands-on components, flexible storytelling avenues and community programming while carefully considering accessibility, preservation and safety. Regular evaluations ensure evolving needs are addressed. Failing to sensitively balance enrichment and constraints risks weakening impacts. When developing visual, olfactory or taste-based offerings, authentic place representations, narrative connections, and wellness priorities must be preserved through oversight, training and continual reassessment. Over-commercialization or tokenism undermines goals. Incorporating diversely representative reproductions, fragrances, or regional foods mindfully expresses cultural identities respectfully. With prudent execution and safeguards for potential distractions or marginalization, heritage sites can harness the full advantages of multi-sensory connections to places and histories. To maintain relevancy and commitment over the long term, managers also must avoid rigid, one-dimensional programming, unable to flex with changing perspectives. Stakeholder input mechanisms like advisory boards facilitate responsive adaptation aligned with diverse communities. Neglecting fluidity risks disengagement as unaddressed needs eclipse initial impressions. Furthermore, while innovative applications stimulate novel relationships, cultural integrity and visitor wellbeing protections remain paramount. Heritage stewards depend upon balanced, community-oriented curation, preserving dignity and priorities amid enrichment. Though commercialization sometimes funds operations, experiences optimized for impacts—not profits—best cultivate



enduring investment in shared futures. With conscientious management balancing interests, heritage through multiple senses can motivate sustained civic participation.

### Limitations and future research

While this initial exploratory study provided valuable insights into visitor perceptions of multi-sensory interpretation and its relationship to revisit intentions, the research was subject to certain limitations pointing to continued advancement opportunities. Firstly, the scope was confined to four major heritage sites in Upper Egypt, limiting generalizability given Egypt's immense cultural diversity across regions. Future investigations could employ a broader, more representative sample of rural/urban sites of varying scales to explore how contextual factors may moderate sensory impacts. Additionally, employing open-ended questionnaires alone restricted the depth of understanding attainable through in-depth interviewing approaches. Supplementing surveys with qualitative data collection techniques could capture nuanced stakeholder perspectives in richer detail. While this initial study provided a foundation for understanding multi-sensory heritage management, future investigations addressing its limitations promise to refine interpretations and advance practical applications through a more holistic, community-centered approach.

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