

**Antecedents of memorable heritage tourism experiences:
An application of stimuli–organism–response theory**

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Abstract

Purpose: Based on stimulus-organism-response theory, this study develops and tests a model of memorable heritage tourism experiences. The model proposes that experiencescape, experience co-creation, education and photography are important antecedents of memorable heritage tourism experiences, which is then a driver of place attachment.

Design/methodology/approach: Data for this study were collected using a web-based questionnaire of people aged 18 years and over who had a heritage tourism experience during the previous three months (February–April 2023). The survey was distributed in May 2023 using Amazon Mechanical Turk. A survey link was posted on MTurk, which remained active for the first week of May 2023. Out of the 283 responses received, 272 were valid responses from individuals who met the participation criteria.

Findings: Experiencescape, experience co-creation, education and photography were found to be positive drivers of the memorable heritage tourism experience, with a positive relationship between memorable heritage tourism experience and place attachment.

Originality: Many studies linked to memorable tourism experience mainly replicate Kim et al.'s (2012) memorable tourism experience scale, regardless of the specific study context. This study offers an alternative framework through which alternative antecedents and outcomes of tourists' memorable tourism experiences can be identified.

Keywords: heritage tourism, memorable tourism experiences, place attachment, experiencescape, experience co-creation, tourist education, tourist photography

Introduction

The tourism industry is presently expanding faster than most other economic sectors worldwide and has witnessed phenomenal growth in customer numbers in post-pandemic times (Dwivedi et al., 2024; Li et al., 2024). According to UNWTO World Tourism Barometer, international tourism was at 88% of pre-pandemic levels in 2023, with an estimated 1.3 billion international arrivals. International tourism is expected to fully recover pre-pandemic levels in 2024, with initial estimates pointing to 2% growth above 2019 levels, i.e. 1.5 million foreign visitors (UN Tourism, 2024). The development of the tourism industry is known to have positive effects on the economic growth of the destination countries (Yılancı & Kırca, 2024).

Heritage tourism is a form of tourism that focuses on the historic, cultural and natural value of a destination (Scarpi & Raggiotto, 2023). It is considered especially important because of its scale and reach, which gives it the potential to generate significant and widespread positive impacts (Abraham & Poria, 2020; Liu et al., 2022). Realising this potential relies, however, upon heritage tourism providers presenting customers with tourism products and services that will address their motivations, provide satisfaction, encourage them to return, and inspire them to make word-of-mouth recommendations.

One proposition, which has often been presented in the tourism literature (Hosany et al., 2022), is that tourism providers should strive to make their products and services memorable. A memorable tourism experience (MTE) can be defined as one that is “positively remembered and recalled after the event has occurred” (Kim et al., 2012, p. 13). MTEs are centred in the

individual and represent special events in a person's life that reside in their long-term memories (Kim & Chen, 2019). Offering customers with memorable experiences has a range of benefits for the service providers, including greater revisit intention (Tešin et al., 2023), stronger loyalty behaviours (Coudounaris & Sthapit, 2017), enhanced destination sustainability (Wei et al., 2019) and tourist-destination identification (Mohammad Shafiee et al., 2021). While there is now a substantial literature on MTEs (Chen et al., 2023a), the tendency has been to replicate Kim et al.'s (2012) seven-dimensional model (those dimensions being hedonism, refreshment, local culture, meaningfulness, knowledge, involvement, and novelty), regardless of the specific context in which it is being applied (Stone et al., 2022). Two examples in the heritage setting are the work of Rasoolimanesh et al. (2022) and Lee (2015). Some authors (e.g., Hosany et al., 2022) observe that the antecedents and consequences of MTEs tend, however, to be highly contextual, requiring more research to identify them in specific contexts. Few studies have, nevertheless, investigated alternative constructs that might better explain and inform the delivery of MTEs (Sthapit et al., 2023b).

Kim et al.'s (2012) study also has some limitations which call for its generalisability to be questioned. As Hosany et al. (2022) note, the sample used in Kim et al.'s (2012) study was comprised of students and the MTE scale is therefore not representative of typical tourists. This means that the findings of their study, including the seven dimensions of MTE scale they identified, cannot reliably be generalised. Another potential flaw in Kim et al.'s (2022) study relates to time-lag bias due to respondents being asked to evaluate their tourism experiences within the past five years. According to Loftus (2005), an individual's recollection of past experiences tends to become increasingly distorted with the passage time (Hosany et al., 2022; Park & Santos, 2017). A shortcoming of previous studies based on Kim et al.'s (2012) model is that few have included other constructs that might explain MTEs (Sthapit et al., 2024). It has been observed that because MTEs are such a multifaceted concept, there is minimal consensus about the theoretical basis for the specific constructs that determine MTEs (Hosany et al., 2022).

Indeed, the formation of MTEs is believed to be highly dependent upon the context (Ye et al., 2021). This would appear, for at least two reasons, to be particularly relevant in the case of heritage tourism. First, heritage tourism is primarily concerned with the remembering of tangible (material) and intangible (immaterial) artifacts of the past. Second, an important motivation for heritage tourism is to learn about a place's culture and heritage (Rasoolimanesh et al., 2022). Memory, recollection and nostalgia are therefore likely to be especially important in the production and consumption of heritage tourism experiences. Compared with general tourism, however, little is known about the interplay between features of heritage tourism experiences and the process by which memories of them are formed.

The present study focuses on addressing this research gap by reviewing the theoretical arguments and concepts important to heritage tourism, and then testing a new conceptual model that defines the elements of a memorable heritage tourism experience (MHTE). In other words, contrary to studies replicating Kim et al.'s (2012) MTE scale in new settings, this study aims to propose and test an integrative theoretical model of MHTE. This model will be based on stimulus-organism-response (S-O-R) theory as an alternative to that used by Kim et al. (2012). An MHTE is defined as any heritage tourism experience that is remembered positively and recalled in detail after participating in it. The study contributes to knowledge on MTEs by testing a novel framework with alternative antecedents and outcome of MHTE. The former comprises experiencescape, experience co-creation, education and photography, while the latter comprises place attachment. The results of the study are important because they indicate various means by which destination managers and heritage tourism service providers can facilitate experiences that are more memorable for visitors.

Theoretical background and hypothesis formulation

Stimuli–organism–response theory

This study uses S-O-R theory (Mehrabian & Russell, 1974) as its theoretical foundation. S-O-R theory has recently gained increased attention by tourism academics, doubtless because it can help explain the drivers of consumer behaviour (Wang et al., 2022). In tourism contexts, S-O-R theory has been used to explain tourists' behaviour, not only in terms of what they do during their trip, but also their revisit (Chen et al., 2020a) and word-of-mouth intentions (Chen et al., 2022).

According to S-O-R theory, stimuli represent the external factors in the environment that cause an organism to adopt either avoidance or approach behaviours (Zheng et al., 2019). Stimuli could include, for example, atmospherics and ambience (Kucukergin et al., 2020). In this study, experiencescape, experience co-creation, education and photography are proposed as the stimuli (S) that are received when the individual has a heritage tourism experience.

As the mediating component in the S-O-R theory, 'organism' is defined as the internal processes and structures that intervene between external stimuli and an individual's subsequent actions and responses. In their original model, Mehrabian and Russell (1974) proposed that the organism can adopt various emotional and cognitive states. In tourism research, constructs such as emotions (Jang & Namkung, 2009), memories (Manthiou et al., 2016) and overall satisfaction (Chen et al., 2022) have all been used to represent different states of the organism. In the context of this study, MHTEs are taken to represent the cognitive internal state of the organism (O) (Chen et al., 2022).

Response (or consequence) is conceptualised in S-O-R theory as the organism's reactions to the stimuli, which were referred to as consumers' 'approach or avoidance behaviours' in Mehrabian and Russell's original elaboration of the model. Other studies have taken response to refer to the outcome of the decision-making process undertaken by the organism when faced with changing stimuli. Some previous tourism studies have used revisit intention (Rodrigues et al., 2023) and others word-of-mouth intention (Chen et al., 2022) and destination loyalty (Liu et al., 2022). This study, in contrast, uses place attachment as the response (R) construct.

Experiencescape

As they spend time in a destination, tourists have the opportunity to gain memorable experiences by interacting within the experiencescape (Santoso et al., 2022). The term 'experiencescape' refers to the components of the environment with which tourists interact to co-create their experiences (Mossberg, 2007). Experiencescapes are explicitly constructed spaces, and their construction involves relatively simple spaces being transformed into more complex ones (Chen et al., 2023a). Experiencescapes are used in tourism as resources that can be harnessed to produce positive outcomes for the stakeholders involved (Chen et al., 2023b). They can be relatively small spaces, such as individual restaurants or shops, or they can cover larger areas, such as a heritage park or even an entire city (Jernsand et al., 2015).

An experiencescape is more than simply the physical setting because consumption that occurs within physical and social surroundings offers hedonic benefits (Mossberg, 2007). The key aspects of the tourism experiencescape thus include both a physical experiencescape and a social experiencescape (Baker & Kim, 2020). Experiencescape is often therefore interpreted as a more complex version of the servicescape, comprising components and environments that are both inside and outside of the tourism providing organisation's control (Nikoline et al., 2021). As such, it can be argued that the concept of experiencescape is particularly appropriate to heritage tourism. Indeed, heritage tourists will usually interact with a complex of tangible and intangible 'heritage' elements of the destination (Chen, 2022).

Tourists' positive perceptions of an experiencescape can be expected to result in a high quality of customer experience (Dong & Siu, 2013). Tourists engage in heritage tourism

experiences by interacting with various elements of the experiencescape (Santos et al., 2022). As such, MHTE can be directly influenced by experiencescape (Chen, 2022; Chen et al., 2020b). The following hypothesis is therefore proposed:

H1: Experiencescape positively influences tourists' MHTE.

Experience co-creation

According to Vargo and Lusch (2004), customers are never passive recipients of pre-existing value: they are always active creators of value. This is arguably the case in tourism, particularly since tourists play an active role in deciding what to do during their trip and how to interact with tourism service providers at the destination (Campos et al., 2018). They choose how to satisfy their needs and wants, and they can also influence the experiences of other tourists (Mathis et al., 2016). The concept of experience co-creation recognises that consumers are active agents in constructing their own customised experiences (Prahalad & Ramaswamy, 2004). The tourism product is understood to be particularly conducive to customisation, as it involves the integration of a wide variety of tangible and intangible resources, as well as active participation on the part of the customer (Kahraman & Cifci, 2023). A tourism experience is something that the customer cannot receive passively: they must actively engage with the experiencescape to derive meaningful benefits from it. The importance of tourists taking an active role as experience co-creators at tourism destinations is now very widely accepted by tourism stakeholders (Lo et al., 2024).

Given the socially dense nature of tourism, tourist experiences are believed to be collective and co-created phenomena (Helkkula et al., 2012). Tourists also have significant decision-making power regarding what they do during their trip (Mathis et al., 2016). Co-creation allows tourists to connect personally with service staff (Grönroos & Gummerus, 2014), destination residents, and other tourists (Malone et al., 2017). It also enables them to engage in activities for self-development, such as recreation and learning (Eraqi, 2011). The nature of these interactions can have a substantial impact upon an individual's evaluation of a tourism experience (McCartney & Chen, 2020). Studies indicate that experience co-creation is not only an antecedent of MTEs in general (Campos et al., 2017; Sthapit et al., 2023a) but also that tourists tend to derive greater benefits from tourism experiences that are more memorable (Mathis et al., 2016). The following hypothesis is therefore proposed:

H2: Experience co-creation positively influences tourists' MHTE.

Education

Hirschman and Holbrook (1982) suggest that the consumption of experiences can result in outcomes such as fun, enjoyment, and feelings of pleasure, and that learning can be promoted by harnessing such emotions. Travel is understood to be an important source of personal development: as an experience that can be deep and meaningful, and that can change the way people think and act (Minnaert, 2016). The desire to learn influences not only destination choice but also what the tourist does while staying there (Poria et al., 2004). It has been found that heritage tourists tend to have a strong learning motivation (Deng et al., 2023). It is also noted that tour guides tend to acquire and possess rich knowledge of the destination and its heritage so they can deliver high-quality interpretation for tourists (Io, 2013). Many heritage tourism attractions offer a range of interpretive experiences that encourage and stimulate learning, and from this the acquisition of knowledge and understanding. According to McIntosh (1999), heritage experiences provide tourists with opportunities to learn, which may be through observation of artefacts or performances, or through active participation in on-site activities. One of the objectives that is often set for heritage tourism is to educate people about

the history and shared traditions of the destination (Boonzaaier & Wels, 2018). Heritage tourism also contributes to the public understanding of the need for heritage conservation and its methods. Education can thus be considered an important dimension of heritage tourism experiences (Hung & Petrick, 2011). These experiences can be expected to enhance the tourist's perception that they have had an MTE (Tung & Ritchie, 2011). Studies tend to indicate a positive relationship between education and MTE (Chen et al., 2023a). The following hypothesis is therefore proposed:

H3: Education positively influences tourists' MHTE.

Photography

Photography has long been recognised as a distinguishing symbolic practice in tourism. (Larsen, 2006). People travel to see and take photographs of the very things their imaginations have prepared them to see, according to the stories and images they have already been exposed to (Ek et al., 2008). Photography has been described as “a tool for consuming and constructing the tourist experience” (Scarles, 2013, p. 898). Urry's (1990) concept of the tourists' gaze argues that tourists use photography as an important means by which they perceive and interpret their experience of a particular tourism destination. The portrayal of one's travel experience through photography has become an essential part of the increasingly digitalised global society (Konijn et al., 2016) and is widely considered to be a must-do activity by tourists (Chen et al., 2021). Photography has also been found to make tourism experiences more enjoyable (Diehl et al., 2016) and to increase tourists' levels of happiness (Gillet et al., 2016). Photographs are also important artefacts through which tourists can make links to the histories of places and people (Garrod, 2009). Photographs are also considered tools that can not only create but also psychologically reinforce tourists' memories of their experiences (Mandić & McCool, 2023). The following hypothesis is therefore proposed:

H4: Photography positively influences tourists' MHTE.

Memorable tourism experience and place attachment

Place attachment is defined as the process by which people become emotionally bonded to a specific place (Patwardhan et al., 2020). Many tourism studies have used the notions of place identity and place dependency to measure place attachment. Place identity refers to how far a place is considered distinctive, which emerges through the accumulation of experience of that place (Ramkissoon & Mavondo, 2015). Place dependency, in contrast, refers to the extent to which destinations can meet tourists' needs through, for example, interaction with environmental resources during various tourist activities (Loureiro, 2014). In the context of the S-O-R theory, place attachment can be taken to represent a possible response of the organism (in this case, the heritage tourist) to the stimuli provided in the experiencescape (its heritage characteristics). The degree to which a tourist feels attached to a particular destination has also been found to depend, at least partly, on how far the tourist experience was considered memorable (Li & Wang, 2023; Sthapit et al., 2017, 2022). The following hypothesis is therefore proposed:

H5: MHTE positively influences tourists' place attachment.

Methods

Data-collection method and instrument

Data for this study were collected using a web-based questionnaire of people aged 18 years and over who had a heritage tourism experience during the previous three months (February–

April 2023). The term ‘heritage tourism’ was defined as covering, inter alia, visiting historic sites such as castles and museums, eating locally distinctive food, or participating in a cultural festival. A convenience sampling technique was used, the key advantages of which are that it tends to be cheap, efficient, and simple to implement (Jager et al., 2017). It must be acknowledged, however, that a convenience sample is not necessarily representative of the population from which it has been drawn, which serves to limit the generalisability of any empirical findings.

The first section of the questionnaire captured respondents’ demographic and travel-related characteristics. The second comprised the measurement items for the seven constructs used in the hypothesised model (experiencescape, experience co-creation, education, photography, MHTE and place attachment), with all items scored on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Experiencescape was measured using five items adapted from Pizam and Tasci (2019); experience co-creation using five items adapted from Mathis et al. (2016); education using four items adapted from Oh et al. (2007); photography using three items from Trinanda et al. (2022); MHTE using three items adapted from Oh et al. (2017); and place attachment using eight items adapted from Gross and Brown (2008) and Yuksel et al. (2010). Table 1 provides details of the eight constructs used in the conceptual model (see Figure 1). These indicate that while there were no significant issues with respect to kurtosis, there was a problem of skewness related to two of the variables of the photography construct (i.e., PHO1 and PHO2), all the three variables of MHTE, and the variable EX1 of the experiencescape construct.

** Figure 1 near here **

** Table 1 near here **

The questionnaire was pre-tested by five tourism researchers in April 2023 to check the relevance, clarity, flow, and phrasing of the questions. Respondents were encouraged during the pre-test to identify anything they found unclear or ambiguous, or to which they had difficulty responding. Some minor changes were made to the questionnaire on the basis of these comments, mainly in the form of correcting grammatical errors and clarifying sentence structure. The main survey was distributed in May 2023 using Amazon Mechanical Turk (MTurk). A survey link was posted on MTurk, which remained active for the first week of May 2023. Out of the 283 responses received, 272 were valid responses from individuals who met the participation criteria.

Data analysis and results

Slightly more respondents were male (52%), while ages ranged from 20 to 66 years, the largest group being between 30 and 39 years old. Most were married and US American. Over half were first-time visitors and most were making trips organised by a tour operator. The largest group comprised those who travelled with their family members, followed by with their friends, partner, colleagues, boyfriend, alone, and girlfriend.

A confirmatory factor analysis (CFA) was performed using AMOS 28 to assess the model fit. A CFA generates approximately the same findings to partial least squares-structural equation modelling (PLS-SEM), as the recent PLS4 method calculates the covariances for the testing of hypotheses. Additionally, CFA statistics are sufficient to assess the model fit. This study then used SPSS to calculate the means of the items and performed exploratory factor analysis (EFA). The final improved version of the model shows satisfactory results in terms of model fit. However, the initial output of the structural equation modelling (SEM) using CFA revealed a rather high chi-square/df = $2295.727/305 = 7.52$, which is above the criterion

value of chi-square/df = 3 (Hair et al., 2019). In particular, the initial chi-square was 2624.955, the number of parameters for the model (NPAR) was 99, and the degrees of freedom (df) was 335. The initial run of the model revealed that some of the loadings were above 1, resulting in the model needing to be run four more times in order to reach the point where the model became a unidimensional one (meaning all items of the constructs had loadings less than 1). At the fifth run, the model had NPAR of 96 and a chi-square value of 2627.549.

The potential improvement of the fit of the model can be shown by some issues of the modification indices through CFA. Another 11 runs were therefore conducted to achieve an improvement in the fit of the model by correlating the errors of the items within a construct (Figure 2). The last run resulted in an NPAR of 107 and a chi-square value of 2379.450. Moreover, the 143rd case of the sample had a Mahalanobis value of 79.186, which made it acceptable to keep it for the fit of the model. This case was therefore not eliminated from the sample. Other cases did not show significant Mahalanobis values and were below 50.000. The value of the standardised regression weight of item PA1 was found through CFA to be 0.444, which was below the threshold of 0.5. This item was therefore eliminated from the final model, leading to the improvement of the fit of the model, with an NPAR of 100 and a final chi-square value of 2296.727 with 305 degrees of freedom and 100 parameters.

** Figure 2 near here **

Table 2 shows the correlation matrix related to the last run of the CFA. The squared values of average variance extracted (AVE) for all constructs were higher than the values of correlations horizontally and vertically. There was therefore no problem evident in respect of potential multicollinearity between the items.

** Table 2 near here **

Table 3 displays the results of the hypotheses testing based on the covariances of the last run of CFA. All five hypotheses were supported, being positive in direction and statistically significant at the 99% confidence level.

** Table 3 near here **

The assessment of discriminant validity (DV) was made through the Fornell and Larcker (1981) criterion and the heterotrait-monotrait (HTMT) ratio (Ab Hamid et al., 2017). On the one hand, Fornell and Larcker's criterion was satisfied, as all constructs separately had values of AVE above than 0.5. The mean of AVEs was 0.744, which is above the criterion value of 0.7. Therefore, this value of 0.744 suggests adequate convergent validity (Bagozzi & Yi, 1988). Although there was no problem with the convergent validity, it was decided that the heterotrait–monotrait (HTMT) ratio should also be calculated to test the DV. Anderson and Gerbing's (1988) criterion was applied to determine the existence of DV. For this purpose, a chi-square difference test was used to compare a single-factor model with a two-factor model. Additionally, the HTMT ratio was used to evaluate the DV (Henseler et al., 2015), and it is found that the HTMT ratio between the constructs is 0.65 which is less than 0.85 (the acceptable criterion for the HTMT ratio). This procedure therefore demonstrated the existence of DV. Moreover, according to McNeish and Wolf (2020), the issue of a misalignment in the representativity of the constructs is effectively assessed by using the CLC estimator based on R software of Marzi et al.'s (2023) validity measure of latent variables. This analysis suggested that there was no such issue.

** Table 4 near here **

With respect to reliability, Table 4 shows that all the values of Cronbach's alpha were above the criterion value of 0.7: the mean average value of Cronbach's alpha was 0.845. In addition, the composite reliability values for all six constructs were above 0.5 and the average composite reliability is 0.683. Both Cronbach's and CRs showed high reliability for all six constructs.

The EFA results (Table 4) show that the items of four constructs were well identified by their items, namely F3: Education, F4: Photography, F5: MHTE, and F6: Place Attachment. These four constructs were fully identified by their items (all factor loadings were above 0.5). However, two constructs, namely F1: Experiencescape, and F2: Experience co-creation, were not well identified by their items (below 0.5 factor loadings). The construct F1: Experiencescape was not well identified by its five items (all factor loadings are below 0.5) and the construct F2: Experience co-creation was identified with only one item, EXCO5, with a factor loading value above 0.5.

Table 5 shows that MHTE is a mediator between three of the antecedent factors and place attachment, namely experiencescape and place attachment, experience co-creation and place attachment, and photography and place attachment. The results also show that MHTE is not a significant mediator (complete mediator) between education and place attachment.

** Table 5 near here **

Discussion and conclusion

Guided by the S-O-R theory, the aim of this study was to propose and test an integrative theoretical model of MHTE. It built on Kim et al.'s (2012) MTE model by incorporating other factors that may impact MTEs in the specific context of heritage tourism. The empirical results support all five hypotheses.

First, experiencescape was found to exert a positive impact on MHTE (H1). This corresponds to the findings of studies that indicate a favourable interaction with the various elements of the experiencescape will create more memorable experiences (Chen, 2022; Chen et al., 2020b). The results thus confirm the prominent role of experience co-creation in the formation of memorable experiences.

Second, experience co-creation was found to be a positively and statistically significant factor affecting MHTEs (H2). This supports previous studies indicating that tourists' experiences tend to be memorable when they can interact with others (Campos et al., 2017; Mathis et al., 2016; Sthapit et al., 2023a). Tourists who engage actively with the service provider and other tourists during a heritage tourism experience are more likely to have more MHTE. Those for whom the experience is passive, perhaps because the tour is designed to minimise interaction, tend to find it less memorable.

Third, education was found to be another key predictor of MHTE, indicating that education had a direct and positive impact on tourists' MHTE (H3). This finding corresponds with studies indicating that education is a derivative of positive experiences during a trip that tourists can recall after returning home and is linked to memorability (Chen et al., 2023a).

Fourth, photography was found to have a positive impact upon MHTE. Heritage tourists who enjoyed taking photographs tended to report more MHTEs, suggesting that engaging in photography contributes to making the heritage tourism trip more memorable. Photography is thus confirmed as an important tool for helping tourists and heritage sites to co-construct a MHTE. This finding supports H4 and corroborates studies indicating that photographs can both create and psychologically reinforce tourists' memories of their experiences (Mandić & McCool, 2023), in this context, heritage tourism experience.

Fifth, the proposed positive association between MWTE and place attachment was confirmed (H5). Tourists who have strong memories of their heritage tourism experience are more likely to develop a strong emotional attachment to the destination. Having memorable encounters with the heritage tourism site contributes to tourists having a deeper attachment to the destination. This result is consistent with existing studies that have identified a positive impact of MTEs on place attachment (Li & Wang, 2023; Sthapit et al., 2017, 2022).

Theoretical implications

This study offers three main theoretical contributions. First, the study responds to demands from the MTE literature for studies to identify and confirm context-specific antecedents and outcomes of MTEs (Hosany et al., 2022). Previous studies have tended to be related to Kim et al.'s (2012) work, usually replicating their model using the same variables and scales (Hosany et al., 2022). As such, few studies have examined other experiential dimensions that may have an impact on MTEs in specific contexts (Sthapit et al., 2023; Stone et al., 2022). This study offers an alternative framework through which alternative antecedents and outcomes of tourists' MTEs can be identified.

Second, given the relative lack of studies related to MHTE, this study provides greater clarity on the specific factors that characterise MHTEs and increases understanding of the phenomenon. The results of this study can, therefore, guide future research directions and new discourses. Future studies should, therefore, be cautious about directly transferring Kim et al.'s (2012) standard MTE model and scales directly into new settings (Hosany et al., 2022). While the standard model could fit well, a model based on alternative variables may perform even better.

Third, beyond examining the various antecedents of MHTE, this study also identified MHTE as a significant predictor of place attachment. Existing MTE studies have tended to examine conventional outcome variables, e.g., revisit intention (Zhang et al., 2018). Few previous studies have attempted to link MTE to place attachment (Hosany et al., 2022). This advances the understanding of the outcomes related to heritage tourism experiences and highlights the significance of providing MHTEs, not only for individual tourists but also for the development of strong emotional connections and sustainable relationships between tourists and heritage destinations.

Managerial implications

This study has important managerial implications for destination managers and heritage tourism service providers, particularly in how they best facilitate MHTEs. This should focus on effectively integrating experiencescape, experience co-creation, education, and photography into their experience design.

First, different stakeholders in heritage tourism, such as destination managers and heritage tourism service providers, should take active steps to protect both tangible (material) and intangible (immaterial) artifacts of the past. These are the features of the experiencescape that visitors encounter during heritage tourism. Heritage protection and preservation needs to be embedded into the activities and their status monitored regularly.

Another important implication of the study is that heritage-experience providers should consider tourists to be active co-creators of their experiences. Tour guides, for example, should be actively involved in helping guests to co-create their experiences by interacting proactively with them. An example could be sharing information with tourists about the sites, buildings, monuments and artifacts. This should help capture and maintain tourists' interest, enabling them to maximise the use of their time during their heritage tourism experience. This calls for a shift in the tourism provider's role from service provider to experience provider and ultimately to memorable-experience co-creator. This will, however, require allocating

resources for further training of tour guides to enhance their knowledge and skills related to customer interaction, emotional labor, hospitality, and sociability. This should be built into tour-guide training and accreditation schemes. The focus should be on training guides and encouraging them to facilitate opportunities for tourists to co-create their experiences as they are the frontline staff present when visitors begin experiencing the activity. Such on-site participatory experiences involving social interaction and focused mental engagement will help capture and maintain tourists' interest and enable them to maximise the use of their time during their heritage tourism experience. During on-site heritage tourism experience co-creation, visitors should be the focus of attention, while interactions should be used to help visitors acquire memorable experiences. This calls for a shift in service providers role from heritage tourism managers and product owners to memorable experience co-creators.

Third, heritage tourism service providers could devise strategies that maximise learning opportunities for tourists while they are in the heritage destination, for example, using digital storytelling and employing a full range of multi-media tools to produce appealing stories for visitors. Heritage tourism service providers should also introduce guided active learning tours where visitors learn about the monuments and artifacts, for example, through use of interpretive signage and information in multiple languages. Tourists should be informed of the need for appropriate behaviour during heritage tourism encounters and of conservation efforts to protect the monuments and artifacts. An effective means of achieving this could be to hire more indigenous local guides, who are often able to provide authentic educational experience for tourists. They should be trained, encouraged to share their own passion and knowledge of the site and be considered as new source of information by visitors. Educational activities are often most effective as they combine learning with fun. Many people enjoy friendly competition, and gamifying the learning experience may be one means of achieving this.

Lastly, photography is also an important facilitator of MHTEs. While some heritage destinations are currently adopting measures to deter tourists from taking photographs (especially 'selfies'), photography serves as a means by which tourists interact with the destination and co-create their MHTEs. Arguments that tourists spend too much time looking through the camera lens and not enough time taking in the experiencescape may therefore be misguided. The camera can be an effective vehicle for co-creating MHTEs. Destination managers and heritage tourism service providers could therefore establish 'photography spots' to allow tourists to take photographs, as well as to encourage them to post them on social media platforms. This is likely to further strengthen place attachment to the destination.

Implementing operational measures such as those suggested above are unlikely to suffice in themselves. Destination managers and heritage tourism service providers need to ensure that co-creation principles are carried through to all aspects of the business. This would include, for example, ensuring that the marketing strategies and assets that are used reinforce each of these four antecedents of the MHTE identified in this paper.

Limitations and suggestions for future studies

First, it should be acknowledged that the generalisability of the findings of this study are limited by using convenience sampling and the findings may not be representative of the target population. Future studies should use simple random sampling to mitigate this. Second, data for this study were collected using a web-based questionnaire of people aged 18 years and over who had a heritage tourism experience during the previous three months (February–April 2023). Future studies would benefit by gathering data from respondents who have visited a particular heritage destination. Third, the skewness in some variables may have implications for the generalisability of the findings, which the authors recognise to be a further limitation of the study. Fourth, data were gathered using an online questionnaire, the potential biases of

which are well documented. Fifth, the study participants were also mostly young, with those aged between 30 and 39 comprising the largest group. This could be the result of administering the survey through MTurk. The participants on Mturk may not be representative of the target population. Using a broader range of delivery channels would doubtless help diversify the sample. Sixth, since the questionnaire was written in English, the largest location of study participants was the USA. Future studies would benefit from using a more multicultural data set. Seventh, the data were collected post-visit, so respondents had to rely on their memories of what they did and how they felt at the time. Future studies could therefore collect data from tourists on-site or immediately after their visit. Eighth, this study was limited to four antecedents and one outcome of MHTE. The examination of wider antecedents would further enhance the understanding of MHTEs and supplement the findings of this study. Comparative studies of first-time and repeat, domestic and international tourists including urban and rural heritage tourism experience could yield meaningful insights to add to those gained through the present study.

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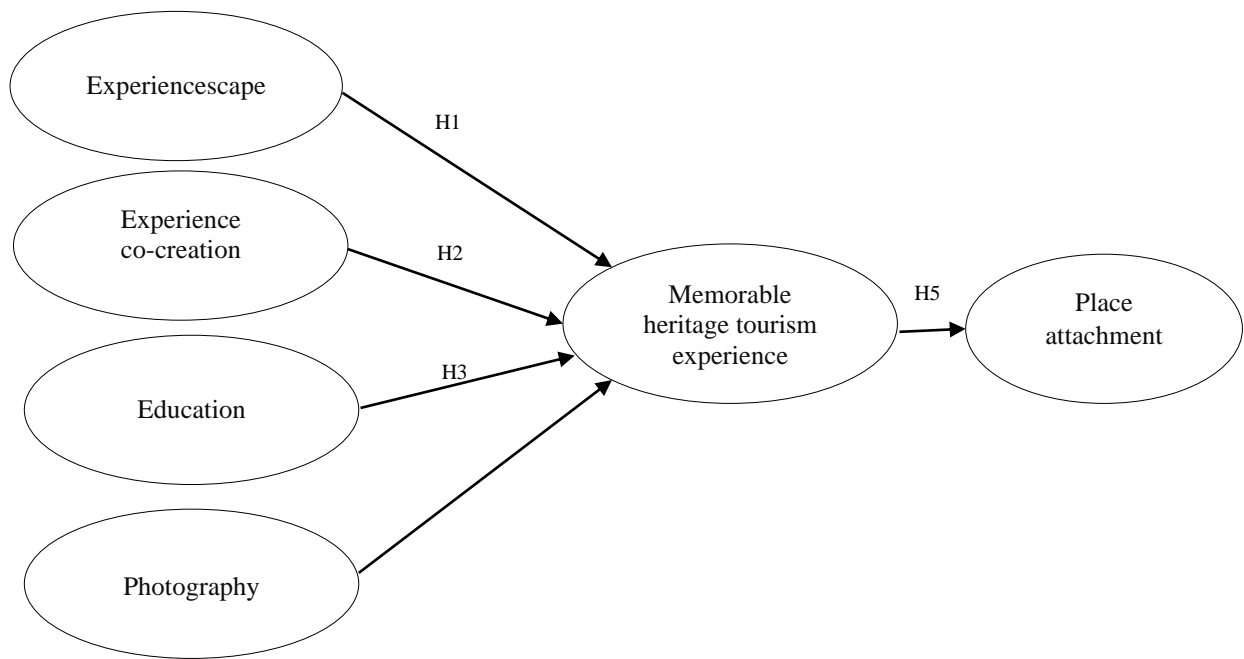


Figure 1 The conceptual model

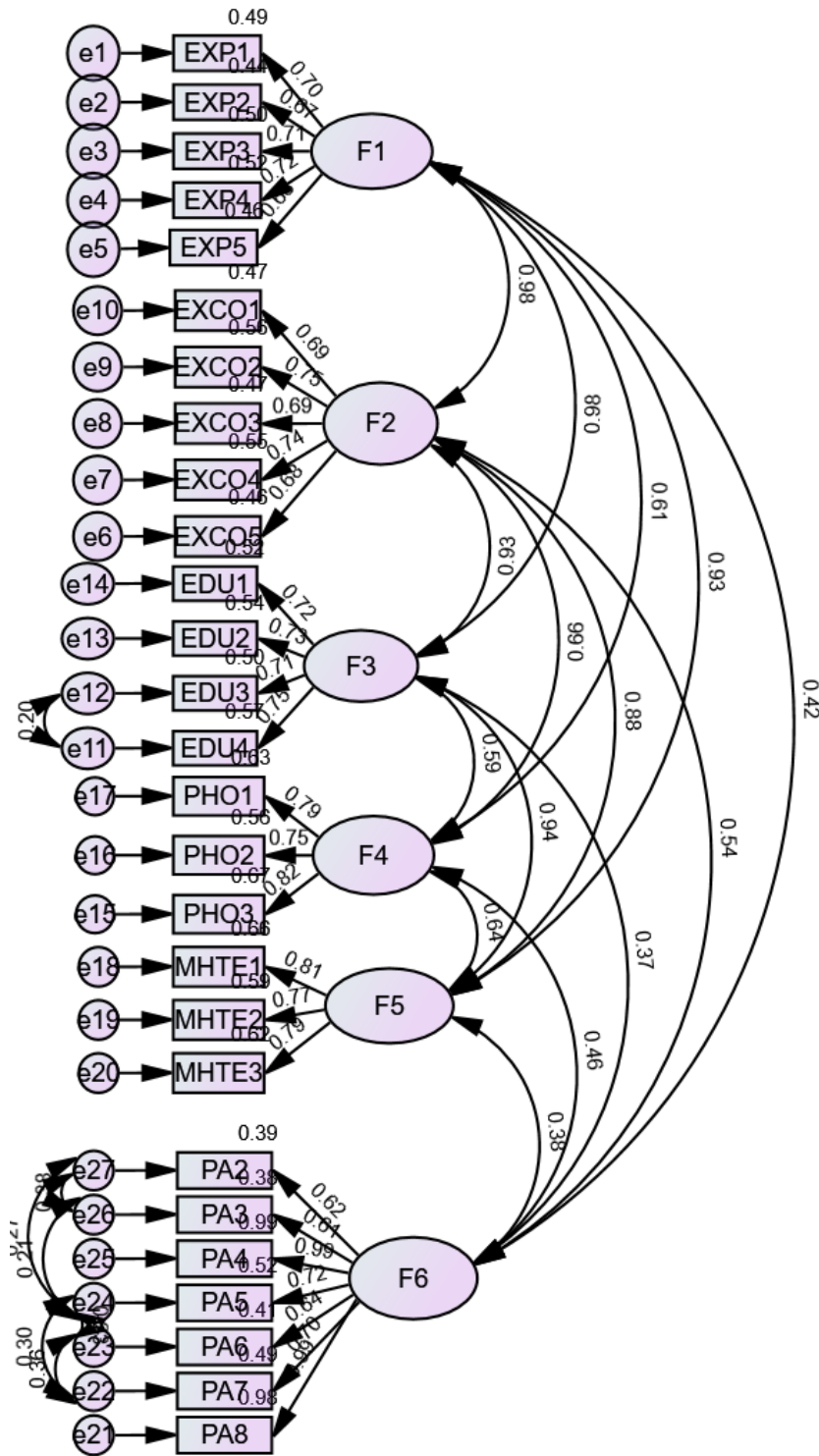


Figure 2. Final solution of the CFA model based on the sample of (N = 272)*

Note*: Constructs: F1: Experiencescape, F2: Experience co-creation, F3: Education, F4: Photography, F5: Memorable heritage tourism experience, F6: Place attachment.

Table 1 Operationalization of the constructs used in this study and some important statistics (N = 272)

	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
Experiencescape (Pizam & Tasci, 2019)	3.98	.065	1.078	-1.049	.148	.622	.294
EX1: The atmosphere during my recent heritage tourism experience was appealing to my senses							
EX2: The level of crowd was comfortable during my recent heritage tourism experience	3.96	.057	.944	-.642	.148	-.231	.294
EX3: The employees at the heritage site were friendly	4.17	.050	.824	-.602	.148	-.539	.294
EX4: The customers were sociable at the heritage site	4.08	.054	.891	-.719	.148	.046	.294
EX5: The environment reflected culture at the heritage site	4.14	.055	.900	-.960	.148	.660	.294
Experience co-creation (Mathis et al., 2016)	3.91	.058	.950	-.647	.148	-.092	.294
EXCO1: Interacting with service staff and other tourists allowed me to have a great social interaction during my recent heritage tourism experience, which I enjoyed							
EXCO2: I felt comfortable interacting with service staff and other tourists during my recent heritage tourism experience	4.06	.052	.866	-.492	.148	-.668	.294
EXCO3: The setting allowed me to effectively interact with service staff and other tourists during my recent heritage tourism experience	4.00	.057	.935	-.702	.148	-.100	.294
EXCO4: My recent heritage tourism experience was enhanced because of my participation in the experience	4.02	.055	.901	-.654	.148	-.061	.294
EXCO5: I felt confident in my ability to interact with service staff and other tourists during my recent heritage tourism experience	3.95	.060	.995	-.764	.148	.054	.294
Education (Oh et al., 2007)	4.04	.056	.930	-.856	.148	.465	.294
EDU1: During the recent heritage tourism experience I learned a lot							
EDU2: My recent heritage tourism experience stimulated my curiosity to learn new things	4.06	.056	.919	-.921	.148	.676	.294
EDU3: My recent heritage tourism experience was a real learning experience	4.06	.059	.974	-.963	.148	.627	.294
EDU4: My recent heritage tourism experience has made me more knowledgeable	4.11	.052	.865	-.836	.148	.469	.294
Photography (Trinanda et al., 2022)	4.00	.063	1.043	-1.009	.148	.633	.294
PHO1: I took pictures during my recent heritage tourism trip							
PHO2: I took pictures to indicate that I have been to a heritage tourism destination	3.88	.070	1.157	-1.013	.148	.343	.294
PHO3: The pictures that I took during my recent heritage tourism trip gives me pleasure	3.91	.063	1.041	-.849	.148	.275	.294
Memorable heritage tourism experience (Oh et al., 2007)	4.07	.059	.977	-1.041	.148	.881	.294
MHTE1: I have wonderful memories of my recent heritage tourism experience							
MHTE2: I will not forget my recent heritage tourism experience	4.14	.059	.976	-1.117	.148	.922	.294
MHTE3: I will remember my recent heritage tourism experience	4.18	.056	.922	-1.106	.148	.992	.294
Place attachment (Gross & Brown, 2008; Yuksel et al., 2010)							

Place identity							
PA1: This heritage tourism destination is a very special to me	4.02	.057	.933	-.868	.148	.612	.294
PA2: I identify strongly with this heritage tourism destination	3.79	.061	1.011	-.692	.148	.108	.294
PA3: Holidaying in this heritage tourism destination means a lot to me	3.80	.065	1.076	-.538	.148	-.486	.294
PA4: I am very attached to this heritage tourism destination	3.66	.063	1.036	-.529	.148	-.202	.294
Place attachment (Gross & Brown, 2008; Yuksel et al., 2010)	3.74	.065	1.073	-.519	.148	-.428	.294
Place dependence							
PA5: Holidaying in this heritage tourism destination is more important to me than holidaying in other places							
PA6: This heritage tourism destination is the best place for what I like to do on holidays	3.68	.063	1.047	-.486	.148	-.273	.294
PA7: I will not substitute this heritage tourism destination with any other place for the experience I had there	3.73	.065	1.065	-.573	.148	-.275	.294
PA8: I get more satisfaction out of holidaying in this heritage tourism destination than from visiting similar destination	3.65	.063	1.034	-.500	.148	-.213	.294
Valid N (listwise)	272						

Table 2. Correlation matrix (N = 272)*

Alt Text: This table is the correlation matrix.

Constructs	F1	F2	F3	F4	F5	F6
F1	<i>0.833</i>					
F2	0.783	<i>0.842</i>				
F3	0.783	0.831	<i>0.854</i>			
F4	0.613	0.665	0.594	<i>0.887</i>		
F5	0.732	0.777	0.838	0.635	<i>0.888</i>	
F6	0.424	0.540	0.369	0.457	0.380	<i>0.869</i>

Note*: Constructs: F1: Experiencescape, F2: Experience co-creation, F3: Education, F4: Photography, F5: Memorable heritage tourism experience, F6: Place attachment. Diagonal shows the square root of AVE.

Table 3. Testing of the hypotheses using covariances via AMOS 28 (N = 272)*

Hypotheses	Relationship*	Estimate		Critical Ratio (t)	Significance (p-value)	Status of hypothesis
		Beta	Standard. Error			
H1	F1 to F5	0.553	0.067	8.279	0.000	Supported
H2	F2 to F5	0.469	0.059	7.950	0.000	Supported
H3	F3 to F5	0.496	0.055	8.959	0.000	Supported
H4	F4 to F5	0.430	0.059	7.291	0.000	Supported
H5	F5 to F6	0.308	0.058	5.271	0.000	Supported

*Note: F1: Experiencescape, F2: Experience co-creation, F3: Education, F4: Photography, F5: Memorable heritage tourism experience, F6: Place attachment.

Table 4. Completely standardised factor loadings, variance extracted, estimates of construct reliability and EFA results (N = 272)*

Items	Mean (using SPSS)	EFA factor loadings (using SPSS)**	Standardised Regression Weights (based on CFA findings)						$\frac{\sum(L_i)^2}{n}$	CR	δ =1-item reliability	
			F1	F2	F3	F4	F5	F6				
EX1	3.98	.408	.697						.697			.303
EX2	3.96	.378	.666						.666			.334
EX3	4.17	.285	.706						.706			.294
EX4	4.08	-.006	.721						.721			.279
EX5	4.14	.086	.680						.680	.694	.611	.320
EXCO1	3.91	.045		.686					.686			.314
EXCO2	4.06	.320		.752					.752			.248
EXCO3	4.00	.244		.685					.685			.315
EXCO4	4.02	.445		.742					.742			.258
EXCO5	3.95	.630		.681					.681	.709	.634	.319
EDU1	4.04	.259			.724				.724			.276
EDU2	4.06	.601			.733				.733			.267
EDU3	4.06	.660			.710				.710			.290
EDU4	4.11	.697			.753				.753	.730	.665	.247
PHO1	4.00	.766				.794			.794			.206
PHO2	3.88	.786				.746			.746			.254
PHO3	3.91	.775				.820			.820	.787	.744	.180
MHTE1	4.07	.632					.810		.810			.190
MHTE2	4.14	.709					.768		.768			.232
MHTE3	4.18	.740					.787		.787	.788	.746	.213
PA2	3.79	.653						.623	.623			.377
PA3	3.80	.649						.615	.615			.385
PA4	3.66	.900						.994	.994			.006
PA5	3.74	.763						.720	.720			.280
PA6	3.68	.734						.637	.637			.363
PA7	3.73	.773						.703	.703			.297
PA8	3.65	.902						.992	.992	.755	.699	.008
Average Variance Extracted			.694	.709	.730	.787	.788	.755	Mean AVE = .744			

Construct Reliability			.611	.634	.665	.744	.746	.699	ACR = .683			
Cronbach's alpha			.820	.833	.831	.829	.831	.925	MCα = .845			

*Note: The following formulae are used for calculating the AVE and CR of the constructs:

AVE is computed as the total of all squared standardised factor loadings (squared multiple correlations) divided by the number of items (Hair et al. 2019, p. 676) or

$AVE = \frac{\sum (\text{standardised regression weights})^2}{n}$ or $\frac{\sum (Li)^2}{n}$

$CR = \frac{\sum \text{of standardised regression weights}^2}{[\sum \text{of standardised regression weights}^2 + (\sum \delta)]}$,

MAVE = mean average variance extracted, ACR = average construct reliability, and MC α = mean Cronbach's α .

Constructs: F1: Experiencescape, F2: Experience co-creation, F3: Education, F4: Photography, F5: Memorable heritage tourism experience, F6: Place attachment.

**The Extraction Method used was: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 15 iterations.

Table 5. Mediator “memorable heritage tourism experience” before and after entering the relationships*

Impact variables*	Beta Estimate	S.E.	C.R.	p-Value	Result***	Status of mediation
Before mediator F5 enters into the relationship F6 to F1						Partial
F6 to F1	0.884	0.101	8.737	0.000	<i>Significant</i>	
After mediator F5 enters into the relationship F5 to F6 to F1						
F6 to F1	0.532	0.068	7.784	0.000	<i>Significant</i>	
F5 to F1	0.897	0.077	11.663	0.000	<i>Significant</i>	
F6 to F5	0.526	0.064	8.264	0.000	<i>Significant</i>	
Before mediator F5 enters into the relationship F6 to F2						Partial
F6 to F2	0.816	0.101	8.047	0.000	<i>Significant</i>	
After mediator F5 enters into the relationship F5 to F6 to F2						
F6 to F2	1.362	0.312	4.365	0.000	<i>Significant</i>	
F5 to F2	1.028	0.098	10.527	0.000	<i>Significant</i>	
F6 to F5	-0.524	0.255	-2.056	0.040	<i>Significant</i>	
Before mediator F5 enters into the relationship F6 to F3						Complete
F6 to F3	0.557	0.097	5.741	0.000	<i>Significant</i>	
After mediator F5 enters into the relationship F5 to F6 to F3						
F6 to F3	0.199	0.391	0.509	0.611	<i>Non-Significant</i>	
F5 to F3	1.023	0.087	11.787	0.000	<i>Significant</i>	
F6 to F5	0.372	0.349	1.064	0.287	<i>Non-significant</i>	
Before mediator F5 enters into the relationship F6 to F4						Partial
F6 to F4	0.576	0.081	7.107	0.000	<i>Significant</i>	
After mediator F5 enters into the relationship F5 to F6 to F4						
F6 to F4	0.439	0.106	4.139	0.000	<i>Significant</i>	
F5 to F4	0.595	0.069	8.603	0.000	<i>Significant</i>	
F6 to F5	0.197	0.111	1.772	0.076	<i>Non-significant</i>	

Notes: * Estimates are found by AMOS28. ** Constructs: F1: Experiencescape, F2: Experience co-creation, F3: Education, F4: Photography, F5: Memorable heritage tourism experience, F6: Place attachment.

*** Results in italics help to decide upon whether the status of mediation is complete or partial, or that there is no mediation.