Received: 7 August 2022 | Accepted: 25 April 2023

DOI: 10.1002/mar.21828

RESEARCH ARTICLE

Psychology & Marketing WILEY

Exploring mental time travel experiences and their influence on behavioral intentions and learning

Jennifer Brannon Barhorst[1] | Nina Krey[2] | Graeme McLean[3]

[1]College of Charleston, Charleston, South Carolina, USA

[2]Rowan University, Glassboro, New Jersey, USA

[3]Business School, University of Strathclyde, Glasgow, UK

Correspondence
Jennifer Brannon Barhorst, College of Charleston, 66 George St, Charleston, SC 29424, USA.
Email: barhorstj@cofc.edu

Abstract

Drawing on cognitive science research, this study presents mental time travel experiences to the marketing literature and explores their value to brands. Specifically, we examine how marketing stimuli can be used to elicit mental time travel experiences and the impact these experiences have on important brand outcomes including purchase intentions, word of mouth, loyalty intentions, and learning. We do so with two studies using branded experiences from two marketing campaigns across four different conditions: augmented reality, a 360° website, a video, and a static image. Results identify positive episodic memories as an important primer of mental time travel experiences and that mental time travel to the past is a key factor to influencing purchase intentions, word of mouth, loyalty intentions, and learning. We also show that cognitive load can have an inhibiting effect on mental time travel's ability to influence purchase intentions, word of mouth, and loyalty intentions. Finally, we demonstrate that a state of immersion can enhance mental time travel's ability to influence learning.

KEYWORDS

augmented reality (AR), cognitive load, episodic memory, immersion, learning, loyalty, mental time travel, PLS, word of mouth

1 | INTRODUCTION

"I put a spell on you, because you're mine. You better stop the things you do, I ain't lyin...You hear me, I put a spell on you, because you're mine". As you read these lyrics of the song, *I Put a Spell on You*, by Nina Simone (1965), think of the last time you heard this song. Where did your mind go? What did you see? What did you feel? What did you see in your mind's eye? Perhaps it was in a blues bar in New Orleans, or perhaps you thought of your grandfather playing this song from his treasured vinyl collection on his old record player. Regardless, your mind most likely went somewhere as you read the lyrics and it was most likely not the same place as someone else. Additionally, you may or may not have been as immersed in your thoughts of where you were when you heard the song, and you may, or may not have had a true feeling of actually mentally being back in that moment when you last heard the song. The point is, everyone is different in terms of how they experience the world and where their minds go when exposed to a creative stimulus. For example, when exposed to a stimulus, some people may travel back in time in their minds to personally remember events through *mental time travel*.

A concept that was initially introduced by Suddendorf and Corballis (2007), mental time travel is the ability to mentally travel back in time to remember and relive past personal experiences or forward in time to pre-imagine future events or scenarios (Berntsen &

Jacobsen, 2008; Wheeler et al., 1997). This is enabled by a conscious state called autonoesis (Wheeler et al., 1997), or chronesthesia (Szpunar, 2010; Tulving, 2002), which enables one to be aware of subjective time.

Phenomenological in nature, the process of mental time travel has been associated with aspects such as mentally seeing, feeling, and hearing an event in one's mind (D'Argembeau & Van der Linden, 2004), with mental time travel to the past involving the remembrance and re-experiencing of an event being associated with sensory aspects of the real world (D'Argembeau & Van der Linden, 2004, 2006). Crucially for marketers, all humans have the ability to engage in mental time travel (Berntsen & Jacobsen, 2008), which is a natural part of their daily lives. Indeed, research indicates that humans seldom remain mentally in the present moment, as they dedicate a considerable portion of their time to reflecting on the past, envisioning the future, or considering hypothetical scenarios (Epstude & Peetz, 2012). Further, research on mental time travel demonstrates that the same brain regions activated during mental time travel to the past are activated when thinking of the future (Benoit & Schacter, 2015; Stawarczyk & D'Argembeau, 2015) and that mental time travel could be a key cognitive process involved in learning as humans learn by reconstructing events in their minds as they are presented with information in their environments (Garcia-Pelegrin et al., 2021; Suddendorf & Corballis, 2007).

Although mental time travel is a well-established stream of research in the cognitive sciences literature (e.g., Addis, 2020; D'Argembeau & Van der Linden, 2004; Suddendorf & Corballis, 2007), there is a surprising dearth of research within the marketing discipline. As investment in worldwide digital marketing spending is anticipated to reach over $645 billion by 2024 (eMarketer, 2021), and as the competent provision of experiences has been outlined as critical to marketers' success in a digital era (Kumar, 2018), there could be opportunities for marketers to optimize this normal, everyday, part of life for consumers by priming mental time travel experiences with the use of digital marketing stimuli. Doing so could potentially influence important brand outcomes such as behavioral intentions (i.e., purchase intentions, loyalty intentions, and word of mouth) and learning as mental time travel the past is associated with future-oriented cognitive processing (Benoit & Schacter, 2015; Stawarczyk & D'Argembeau, 2015) and knowledge building (Garcia-Pelegrin et al., 2021; Suddendorf & Corballis, 2007).

The current study explores a range of digital marketing stimuli, their ability to elicit mental time travel experiences, and the varying effects that mental time travel experiences have on important brand outcomes including behavioral intentions (purchase intentions, loyalty intentions, and word of mouth) and learning. Thus, the objectives of this research are: (1) conceptualize mental time travel experiences and explain the importance of these experiences, and (2) understand the varying influence of mental time travel experiences on behavioral intentions and learning.

We meet the objectives of our research with a between-subjects research design. Participants were exposed to different digital marketing stimuli from two commercially available marketing campaigns that included augmented reality, a 360-website, a video, and a static image. We draw upon the cognitive science, marketing, and technology literature to better understand the elicitation of mental time travel experiences and to build our conceptual model.

This research contributes to literature in the following ways: (1) it broadens the field of experiential marketing (e.g., Brakus et al., 2009; De Keyser et al., 2015; Holbrook & Hirschman, 1982; Hui & Bateson, 1991; Kerin et al., 1992; Lemon & Verhoef, 2016; Schmitt, 1999) by delineating mental time travel experiences as an underutilized, yet important resource for marketers, (2) it adds to the episodic memory literature (e.g., Herz & Brunk, 2017; Thoma & Wechsler, 2021; Tulving, 1972, 1983) with results that suggest that the elicitation of positive episodic memories influences the elicitation of mental time travel to the past, (3) it extends prior research on mental time travel (e.g., Benoit & Schacter, 2015; Suddendorf & Corballis, 2007) by providing empirical evidence of the effects of mental time travel to the past on behavioral intentions and learning, (4) it enhances the understanding of cognitive load (e.g., Hsu, 2017) in consumer experiences by demonstrating that higher levels of cognitive load can negatively influence mental time travel to the past's effect on behavioral intentions, (5) it expands the existing research on immersion (e.g., Brannon Barhorst et al., 2021; Tonietto & Barasch, 2020) by demonstrating that it can have an enhancing effect on mental time travel to the past and learning, and (6) we offer specific actions developers and managers can take to design marketing stimuli to elicit mental time travel experiences (MTTEs) through episodic memories and the importance of the calibration of experiences to elicit optimal outcomes.

2 | IMPORTANCE OF MENTAL TIME TRAVEL EXPERIENCES IN MARKETING

The importance of the provision of experiences to consumers has been widely acknowledged within the marketing literature for decades. From being crucial to competitive brand positioning (Brakus et al., 2009; Schmitt, 1999) to a core component of consumers' journeys with firms (Brakus et al., 2009; Holbrook & Hirschman, 1982), a conscious effort to elicit satisfactory experiences should be a core function of any marketing effort (Schmitt, 1999). This is evidenced in the extensive, current literature on experiences that identifies seven types of experiences: consumption, product, shopping, service, technology, brand, and customer.

As highlighted in Table 1, the literature identifies not only the type of experience, but provides details of specific aspects to experiences, including when, where, and how these experiences take place. These experiences can take place in a store, service setting, or online and can involve products, brands, or technologies (Brakus et al., 2009; Chandler & Lusch, 2015; Dwivedi et al., 2023; Hilken et al., 2021; Hoch, 2002; Hoffman & Novak, 2018; Holbrook, 2000; Mishra et al., 2021; Park et al., 2021; Shahid et al., 2022). Commonly referenced outcomes include hedonic value and utilitarian value through consumer engagement with elements of the experience

TABLE 1 Overview of consumption experiences.

Type of experience	When does it occur	Marketing relevance	Relevant research
Usage	During product use.	Provides hedonic value to consumers during and after consumption of goods.	Holbrook (2000), Holbrook and Hirschman (1982), Mishra et al. (2021), Schmitt (1999)
Product	When interacting with products.	Provides utilitarian and hedonic value and influences consumer judgments, attitudes, preferences, purchase intent, and recall related to products.	Hoch (2002), Hoch and Ha (1986), Kempf and Smith (1998), Mishra et al. (2021)
Retailing	When shopping, engaging with shopping environments (in-store or online), or with a retailer.	Provides utilitarian and hedonic values and influences attitudes, satisfaction, and feelings in relation to experiences during shopping and engagement with environments.	Grewal et al. (2009), Hui and Bateson (1991), Kerin et al. (1992), Shahid et al. (2022)
Service	When interacting with service providers.	Facilitates a form of co-created hedonic or utilitarian value between providers and consumers and can influence attitudes, satisfaction, and feelings when consumers interact with service personnel or during service encounters.	Chandler and Lusch (2015), De Keyser et al. (2015), Park et al. (2021)
Brand	Whenever there is direct or indirect interaction with the brand.	Facilitates sensations, feelings, and cognitions related to a brand's design, identity, packaging, communications, and environments.	Brakus et al. (2009), Shahid et al. (2022), Schmitt (1999)
Technology	During the use of technology.	Facilitates psychological, sensual, emotional, compositional, and spatiotemporal experiences with technology.	Hoffman and Novak (2018), Hilken et al. (2021), McCarthy and Wright (2004), Mishra et al. (2021)
Customer	During the customer's entire purchase journey: prepurchase to postpurchase.	Facilitates emotional, cognitive, behavioral, sensorial, and social responses to a firm's offering during the customer's entire customer journey.	De Keyser et al. (2015), Becker and Jaakkola (2020), Lemon and Verhoef (2016)

(Becker & Jaakkola, 2020; Hoch & Ha, 1986; Holbrook & Hirschman, 1982; Kerin et al., 1992; Mishra et al., 2021). Overall, usage, product, shopping, service, technology, and brand experiences fall under the main umbrella of the customer experiences that take place from prepurchase to the postpurchase phases during the overall customer's purchase journey (De Keyser et al., 2015; Lemon & Verhoef, 2016; Park et al., 2021).

Although a number of useful delineations have been made within the literature, a gap remains related to experiences that take place in the mind. While the importance of cognitive associations within the marketing literature has been acknowledged (e.g., Brakus et al., 2009; Holbrook & Hirschman, 1982; Lemon & Verhoef, 2016; Schmitt, 1999), these conceptualizations need to be strengthened. For example, cognitions in relation to experiences have been identified as "think" campaigns with the aim of "creating cognitive, problem-solving experiences that engage consumers creatively" (Schmitt, 1999, p. 61), the elicitation of "convergent/analytical and divergent/imaginative thinking" (Brakus et al., 2009, p. 54), and simply as a component of a multidimensional construct of customer experience (De Keyser et al., 2015; Lemon & Verhoef, 2016). As such, we propose mental time travel experiences as a new type of experience that marketers can use to influence positive outcomes. We support this assertion with research on mental time travel experiences as they uniquely take place in the mind, are personal in nature, and take one on a mental time travel journey to events or experiences in one's personal past or future. Thus, mental time travel experiences have the benefit of being able to be evoked by a range of marketing stimuli as a mental time travel experience is an individual and personal journey that can be triggered by almost any retrieval cue that resonates with the consumer (Rugg & Wilding, 2000). Due to their propensity to foster simulations of future scenarios (Schacter & Madore, 2016), mental time travel experiences could influence commonly studied brand outcomes such as behavioral intentions as they provide indications of "the strength of one's intention to perform a specific behavior" (Fishbein & Ajzen, 1975, p. 288). Thus, the elicitation of mental time travel experiences could be fruitful for marketers as consumers now live in a world where they can experience a brand in a time and place that suits them through the use of technologies such as augmented reality.

Burgeoning technologies such as augmented reality (Kumar et al., 2023) continue to evolve and have been heralded as fundamental digital marketing assets in the metaverse (Dwivedi et al., 2023). There are many unknowns, however, with regard to mental time travel experiences and the use of such technologies for digital marketing purposes. For example, there are no known factors that marketers can employ to elicit mental time travel experiences through the use of various forms of digital marketing. We, therefore, consulted research in the marketing, cognitive science, and technology literature to build our conceptual model.

3 | THEORETICAL BACKGROUND AND HYPOTHESES

3.1 | Episodic memories and MTTEs

We commence our conceptual model and the concept of mental time travel experiences by first evoking mental time travel through episodic memories. As highlighted in Table 2, all humans have the ability to mentally travel back in time through a memory system called episodic memory (Wheeler et al., 1997). A concept that was initially introduced by Tulving (1972) over 40 years ago, episodic memory is a memory system that facilitates the remembrance of personally experienced events associated with particular times or places that are triggered by a retrieval cue. Episodic retrieval involves an interaction between a "retrieval cue" (self-generated or by the environment) and a memory trace leading to some or all aspects of the episode in the trace (Rugg & Wilding, 2000). It is the remembrance of personally experienced, temporally dated events and differs from semantic memory, or memory based on facts (Herz & Brunk, 2017; Thoma & Wechsler, 2021; Tulving, 1972, 1983), and

TABLE 2 Conceptualizations of mental time travel.

Concept(s)	Definition	Importance and key insights	Relevant research
Autonoetic consciousness awareness, Autonoesis, Chronesthesia	The capacity that enables humans to mentally represent and become aware of their protracted experience across subjective time.	Conceptualized to be a uniquely human ability that enables mental time travel from the past to the present or present to the past in relation to personally experienced events. It differs from noetic awareness, which involves thinking objectively about something that one knows.	Suddendorf and Corballis (2007), Szpunar (2010), Tulving (2002), Wheeler et al. (1997)
Episodic memory	A neurocognitive (brain/mind) system that enables human beings to remember past experiences and to participate in mental time travel.	Delineation of episodic memory as a memory system different from semantic memory, or memory based on facts. It is autobiographical in nature and concerns memory of episodes or events in one's personal past. Imaging studies as well as evidence from patients with brain injuries support this delineation.	Herz and Brunk (2017), Suddendorf and Corballis (2007), Tulving (1972, 1983, 2002)
Mental time travel	The faculty that allows humans to mentally travel back in time to re-live personal events or forwards in time to pre-live personal events.	Mental time travel shares phenomenological characteristics that activate similar parts of the brain as mental time travel to the future and has been associated with the ability to re-live or pre-live experiences. Neuroimaging, for example, demonstrates that a core network of brain regions, referred to as the default network, becomes engaged when people think about their personal future and past. In addition, neuropsychological observations of patients who have damage to specific regions within the default network have demonstrated deficits in both past and future-oriented mental time travel.	Benoit and Schacter (2015), Suddendorf and Corballis (2007)
Mental time travel to the past	The ability to consciously mentally project oneself backward in time to re-live/re-experience previous events.	Mental time travel to the past has been associated with an ability to re-live experiences by seeing, hearing, or feeling what one experienced in a remembered experience(s).	D'Argembeau and Van der Linden (2004), 2006
Mental time travel to the future	The ability to consciously mentally project oneself forward in time to anticipate, pre-live/pre-experience events in the future.	Mental time travel to the future is based on previous experiences and enables one to imagine specific events in the future. It comprises hypothetical episodes such as the planning or imagining of specific events in the future or mental anticipation of some event and emerges during child development and shows a parallel decline with aging.	Benoit and Schacter (2015), Suddendorf and Corballis (2007)

our "knowledge of the world" (Atance & O'Neill, 2001). Episodic memories can comprise one event or a series of events that comprise the personal episodes of one's past and are key to mentally traveling back in time (Suddendorf et al., 2009).

Episodic memories can be evoked voluntarily (e.g., asking someone to think of a time when particular events occurred) or involuntarily (e.g., seeing the image of a Captain Crunch cereal box and being mentally transported to Grandmother's kitchen and childhood memories being evoked). Involuntary episodic memories, or memories of personal experiences that come to mind without a conscious attempt at retrieval, have been shown to be an everyday phenomenon and a normal part of our existence (Berntsen & Jacobsen, 2008). Further, although episodic memories can be either positive or negative in valence, involuntary episodic memories that occur in everyday life are more often about positive rather than negative events (Berntsen & Rubin, 2008). Thus, a critical aspect to the conceptualization of mental time travel is the ability to remember events in the past that are *unique* to each individual. It is, therefore, a process that is deeply personal in nature, yet can be elicited by any retrieval cue in the environment that resonates with an individual. Thus, unlike recalling memories of advertisements which are primarily semantic in nature (e.g., what product or brand was featured in the advertisement), mental time travel to the past through the elicitation of episodic memories involves being mentally transported, at will, into one's personal past and into one's personal future (Tulving, 1993).

As research demonstrates that the elicitation of positive episodic memories can be elicited with any retrieval cue, can happen spontaneously, and support mental time travel to the past, we commence our conceptual model with the following hypothesis:

H1. The elicitation of positive episodic memories positively influences mental time travel to the past.

3.2 | Mental time travel to the past

Powerfully for marketers, mental time travel to the past, or the conscious, self-aware act of being mentally transported back in time to personally remembered events and experiences (Suddendorf & Corballis, 2007), has been associated with future mental time travel (Benoit & Schacter, 2015) and the ability to mentally see, feel, and hear a remembered event in mind (D'Argembeau & Van der Linden, 2004, 2006). Such mental time travel experiences can also involve the remembrance and re-experiencing of an event being associated with sensory aspects of the real world (D'Argembeau & Van der Linden, 2004, 2006). Most of the research to date demonstrates that mental time travel to the past and the future involves overlapping neural activities (see Benoit & Schacter, 2015; Stawarczyk & D'Argembeau, 2015), or patients with cognitive impairments have been studied to examine whether mental time travel to the past influences future mental time travel. For example, research of memory-impaired patients demonstrates that deficits in the ability to remember one's past are strongly correlated to deficits in the ability to imagine one's future (Hassabis et al., 2007; Klein et al., 2002; Rosenbaum et al., 2005; Tulving, 1985). D.B., a case study from the cognitive science literature, suffers a form of brain damage that results in severe amnesia for the personally experienced past, with his knowledge of the nonpersonal past relatively preserved. His ability to imagine future events has a similar pattern in that he is unable to imagine personally relevant events or experiences, yet his ability to anticipate or imagine events in the public domain is comparable to neurologically healthy, age-matched controls (Klein et al., 2002). K.C., another case study with brain impairments, is unable to bring up a single episodic memory experience from any point in his past as well as an inability to imagine anything he is likely to do on any subsequent occasion (Rosenbaum et al., 2005; Tulving, 1985). Thus, through brain imaging and case studies, cognitive scientists have determined that a core function of constructing future scenarios, such as intentions (Schacter et al., 2012), is the ability to mentally travel back in time. We therefore hypothesize:

H2a. Mental time travel to the past positively influences purchase intentions.

H2b. Mental time travel to the past positively influences loyalty intentions.

H2c. Mental time travel to the past positively influences word-of-mouth intentions.

3.3 | The moderating effect of cognitive load

Although marketing stimuli have the propensity to elicit positive outcomes for brands, one's ability to take part in a mental time travel experience could be somewhat reduced or impaired when a marketing stimulus elicits a higher cognitive on individuals. Cognitive load theory (see Sweller, 1988) suggests that large quantities of information (heavy cognitive load) can negatively affect an individual's cognitive processing and task completion. Hence, scholars suggest that exposure to some forms of stimuli may result in high levels of cognitive load (Hsu, 2017). Cognitive load theory further details that information will only be stored in an individual's long-term memory after first being processed by "working memory." However, such working memory is exceptionally limited in both duration and capacity (Suh & Prophet, 2018). Heavy cognitive load often results in error or interference with a task (Kalyuga et al., 2003) and can increase an individual's reliance on heuristics (Biernat et al., 2003). In turn, individuals may experience high levels of cognitive load as marketing stimuli may require them to process large quantities of multisensory information during their experience (Hsu, 2017). As such, heightened cognitive load as a result of exposure to a marketing stimulus may inhibit the ability of one to fully partake in mental time travel to the past as they are fully engrossed or engaged in the experience. Thus, the relationship between the elicitation of episodic memories and mental time travel to the past and mental time travel to the past's effect on future-oriented cognitions may be weakened. We therefore hypothesize:

H3a. Cognitive load will have a negative moderating effect on the relationship between positive episodic memories and mental time travel to the past.

H3b. Cognitive load will have a negative moderating effect on the relationship between positive episodic memories and loyalty intentions.

H3c. Cognitive load will have a negative moderating effect on the relationship between mental time travel to the past and purchase intentions.

H3d. Cognitive load will have a negative moderating effect on the relationship between mental time travel to the past and word-of-mouth intentions.

3.4 | Mental time travel to the past and its influence on learning

It is widely accepted that one learns from past experiences. Humans have done so as a matter of survival to mitigate threats to their everyday lives. Upon encountering new stimuli or circumstances, the human mind engages in a reconstruction of previous events to process familiar versus unfamiliar information (Schomaker & Meeter, 2015; Tulving & Kroll, 1995). In this mental reconstruction of events, humans may undertake mental time travel which involves the reactivation of sensory-perceptual and contextual details during the memory retrieval process (Rasmussen & Berntsen, 2014), and this process is key to cognitive processing and learning (Garcia-Pelegrin et al., 2021; Suddendorf & Corballis, 2007). Thus, mental time travel can potentially facilitate learning by allowing individuals to reflect on past experiences and to identify patterns and connections that can help them to learn about their environments.

Mental time travel to the past may, therefore, provide opportunities for marketers that are yet to be explored as previous research indicates that our senses are key to human cognition (Barsalou, 1999; Shapiro, 2010)—that is, humans learn through their senses as they engage with the world. As mental time travel to the past enables one to simulate new knowledge based on past, personal experiences that include phenomenological aspects (Benoit & Schacter, 2015; Stawarczyk & D'Argembeau, 2015), we hypothesize the following:

H4. Mental time travel to the past positively influences learning.

3.5 | The moderating effect of immersion on mental time travel and learning

Research demonstrates that immersive stimuli provide high quality and quantity of sensory stimuli to an individual (Slater, 2009) and that experiences that elicit higher states of immersion have the ability to enhance information processing and learning (Brannon Barhorst et al., 2021; Georgiou & Kyza, 2018). One key reason immersion could potentially enhance learning is its propensity to increase the level of engagement with the material being learned. For example, research demonstrates that being fully immersed in an augmented environment can elicit higher levels of cognitive information processing, greater enjoyment (Brannon Barhorst et al., 2021), and greater understanding of material (Dede, 2009) than in non-immersive environments. Further, studies also show that when individuals are fully immersed in virtual environments, they are more likely to engage in mental time travel and simulate past and future events (Hassabis et al., 2007), which can support learning (Garcia-Pelegrin et al., 2021; Suddendorf & Corballis, 2007).

Hence, this suggests that all marketing stimuli may not be equal in terms of the effect that mental time travel to the past has on learning. Immersion in the stimulus may provide sensory and goal-directed cues (Novak et al., 2003) that enable a better sense of what has been experienced previously through mental time travel. We, therefore, hypothesize the following:

H5. Immersion will have a positive moderating effect on mental time travel to the past and learning.

3.6 | Conceptual model

Our conceptual model was tested using two studies that utilized stimuli from two commercially available marketing campaigns. Figure 1 illustrates our hypotheses, in which we propose that positive episodic memories (H1) will have a positive influence on the elicitation of MTTEs by taking one on a mental journey to the past. We also propose that mental time travel to the past will positively influence purchase intentions, loyalty intentions, and word of mouth intentions (H2a-H2c) and that cognitive load will negatively moderate these relationships (H3b-d), as well as the association between positive episodic memories and mental time travel to the past (H3a). Furthermore, we hypothesize that mental time travel to the past will have a positive influence on learning (H4), and that immersion will positively moderate this relationship (H5).

4 | STUDY 1

4.1 | Study design

Study 1 had 701 participants and included marketing stimuli that featured a perfume brand, snow globe, and shopping bags. The campaign was accessible via various media outlets ranging in their level of cognitive load from high to low including an AR filter, a 360-website, and a YouTube video (please refer to the ANOVA results in Section 4.6.1 for the assessment of cognitive load across experiences). For each condition, participants accessed the online survey and followed instructions to access the corresponding experience (i.e., AR, 360-website, or video). Once participants completed the experience, they answered questions related to the constructs of

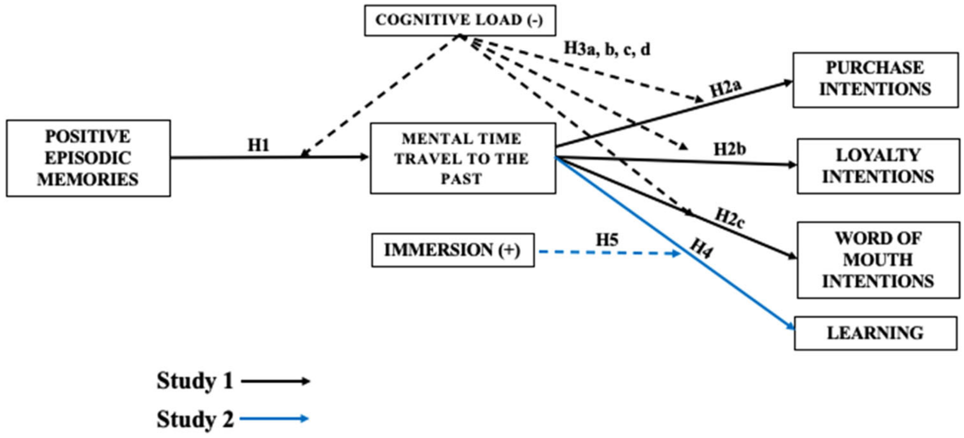

FIGURE 1 Conceptual model.

interest and demographic questions. In addition, we utilized established scales proposed by Lehmann et al. (2008) to assess previous purchase experience of the perfume, brand awareness, and brand attitude. These variables were controlled for in our analysis, and we found that they did not significantly impact our model.

Regarding the sampling procedure, a nonprobability judgment selection procedure (Burgess, 2003) was used to select participants. We identified consumers who were at least 18 years old and purchased the focal products (perfume in Study 1 and toys in Study 2) as our populations of interest (see Table A1 in Appendix A for the sample sociodemographic profile). We chose a data access panel as the sampling frame as use of the panel enabled flexible pre-screening and the operationalization of the commercially available digital marketing campaign stimuli in an online format. Participants were paid $9.00 an hour (pro-rata) for their participation.

For the AR experience, participants watched a video clip that included instructions on using a Snapchat code. Participants then completed the experience featuring an augmented reality snow globe that could be moved by shaking the smartphone either from side to side or back and forth (see Figure 2).

In the 360-website experience, participants were directed to a microsite of the campaign that featured the same perfume. Following the directions on the screen, participants were asked to move the show globe with their mouse (see Figure 3).

Finally, participants were directed to a YouTube video and were instructed to turn on their sound and watch the entire video. Once again, the same snow globe and perfume were displayed (Figure 4).

Two attention checks were included in each experience to verify participants' engagement in the experience. Participants who did not pass both attention checks were excluded.

4.2 | Measures

The online surveys for Study 1 included established scales to study the proposed relationships (see Table 3). All items were measured

FIGURE 2 Augmented reality experience.

with a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). *Positive episodic memories* were represented by six items by Marchegiani and Phau (2013) (α = 0.96). M*ental time travel to the past*, adapted from Eren (2009), was also measured with six items (α = 0.95). Behavioral intentions were assessed utilizing three scales representing *purchase intentions*, *loyalty intentions*, and *word-of-mouth intentions*. A 3-item scale adapted from Yim et al. (2017) captured *purchase intentions* (α = 0.96). *Loyalty intentions* were administered with four items (α = 0.95) from Zeithaml et al. (1996). *Word-of-mouth intentions* were measured with a 3-item scale (α = 0.97) from Hutter and Hoffmann (2014).

As the collected data reflected self-reported measures, we attempted to minimize the influence of common method variance by separating predictor and criterion variables in the survey, including

FIGURE 3 360-Website experience.

FIGURE 4 YouTube video.

reverse coded items, and ensuring respondent's anonymity (Podsakoff et al., 2003). Regarding statistical assessment, we performed different tests including Harman's single-factor test, full collinearity test based on variance inflation factors, and common latent factor (Kock, 2015; Podsakoff et al., 2003; Ranaweera & Jayawardhena, 2014). Harman's single-factor results showed that no single factor accounted for more than 35% of the total variance, which remains below the acceptable threshold of 50% (Podsakoff et al., 2003). Following Kock (2015), we assessed the variance inflation factor scores for all latent variables in the model. Since all variance inflation factor values were below 3.3, the model can be considered free of common method bias. Finally, a common method factor and corresponding indicators representing all constructs were estimated to compute each indicator's variances as explained by the substantive construct (Ranaweera & Jayawardhena, 2014). Here, insignificant method factor loadings and greater variances of indicators than their method variances indicate that common method bias is not a concern (Liang et al., 2007). Results confirmed the average explained variance of indicators of 0.69 with average method-based variance of 0.11. Since most method factor coefficients were not significant, the small magnitude and insignificance of method variance further confirm the absence of common method bias concerns. Overall, the procedural steps, together with the various statistical assessments, led us to the conclusion that common method variance was not influencing the findings of this study.

4.3 | Analysis

We employed partial least squares structural equation modeling (PLS-SEM) to estimate the proposed relationships using *SmartPLS 3* (Ringle et al., 2015). PLS-SEM was the preferred analytical approach due to (1) the exploratory nature of the study, (2) the optimized prediction of dependent variables, and (3) the assessment of multigroup analysis (PLS-MGA) via permutation test (Ringle & Sarstedt, 2016).

For the purpose of our study, we first assessed the measurement (outer) model, followed by the structural (inner) model (Hair et al., 2019). Before completing the MGA, the invariance pattern was examined using the MICOM method (Basco et al., 2020; Henseler et al., 2016). The MGA utilized a permutation test as results have shown to be more accurate compared to a parametric test (Ghasemy et al., 2020).

4.4 | Measurement model

Measurement model assessment draws on the evaluation of internal consistency, indicator reliability, and validity of reflective constructs (Hair et al., 2019; Henseler et al., 2016). All outer loadings load on their corresponding constructs and are highly significant (p < 0.05), as shown in Table 3. The composite reliability values range between 0.96 and 0.98, while the average variance extracted values range between 0.79 and 0.96; thus, composite reliability and average variance extracted values exceed common thresholds of 0.70 and 0.50, respectively (Hair et al., 2019). Therefore, results support the measurement model's internal consistency and convergent validity.

Discriminant validity relies on the more recently established heterotrait–monotrait ratio of the correlations method (Sarstedt et al., 2017). As shown in Table 4, heterotrait–monotrait ratios are below or around the conservative threshold of 0.85 (Sarstedt et al., 2017) and none of the heterotrait–monotrait ratio confidence intervals for each construct combination relationship include 1. Overall, the measurement model confirms discriminant validity.

4.5 | Structural model

Before examining the relationships in the structural model, variance inflation factor values of predictor constructs are assessed and range between 1.00 and 1.01. Therefore, collinearity is not an issue as all

TABLE 3 Construct, descriptive, and reliability for Study 1 and Study 2.

	Study 1				Study 2			
Constructs and items	Loading	α	Composite reliability	Average variance extracted	Loading	α	Composite reliability	Average variance extracted
Positive episodic memories (adapted from Marchegiani and Phau, 2013)		0.96	0.96	0.82				
It reminded me of good times from my past.	0.855							
It reminded me of when I was young.	0.919							
It reminded me of my childhood days.	0.905							
It brought back memories of being a kid.	0.901							
It was a pleasant reminder of my past.	0.925							
It brought back memories of good times from my past.	0.915							
Mental time travel to the past (adapted from Eren, 2009)		0.95	0.96	0.79		0.92	0.94	0.72
The memory of an event sprang to my mind when I was in the experience.	0.902				0.871			
While remembering the event, I felt as though I were reliving it.	0.893				0.874			
While remembering the event, I felt that I traveled back to the time when it happened.	0.888				0.848			
I could see the event in my mind.	0.911				0.819			
I could hear the event in my mind.	0.849				0.797			
I could feel the emotions that I felt then.	0.914				0.868			
Purchase intentions (adapted from Yim et al., 2017)		0.96	0.98	0.94				
I am certain I will purchase this perfume in the future.	0.963							
It is likely that I will purchase this perfume in the future.	0.977							
It is probable that I will purchase this perfume in the future.	0.969							
Loyalty intentions (adapted from Zeithaml et al., 1996)		0.95	0.96	0.83				
I would encourage friends and relatives to shop for this perfume.	0.924							
I would say positive things about this perfume to other people.	0.910							
I intend to shop for this perfume in the future.	0.914							
I would recommend this perfume to someone who seeks my advice.	0.933							
I would consider this perfume my first choice when buying perfume in the future.	0.861							

(Continues)

TABLE 3 (Continued)

Constructs and items	Study 1 Loading	Study 1 α	Study 1 Composite reliability	Study 1 Average variance extracted	Study 2 Loading	Study 2 α	Study 2 Composite reliability	Study 2 Average variance extracted
Word-of-mouth intentions (adapted from Hutter and Hoffmann, 2014)		0.97	0.98	0.96				
I will share this experience with others.	0.971							
It is likely that I will tell others about the experience.	0.982							
I will tell others about this experience.	0.981							
Learning (adapted from Schlinger, 1979)						0.83	0.84	0.75
I learned something from the experience that I did not know before.					0.832			
The experience told me about a new product that I think I'd like to try.					0.910			
During the experience, I thought how that store might be useful to me					0.850			

Note: All scales measured 1 (strongly disagree) to 7 (strongly agree).

variance inflation factor values remain below the suggested cutoff value of 5 (Sarstedt et al., 2017). Next, the explanatory power is examined by assessing the variance explained in each endogenous construct (R^2) (Hair et al., 2019). The model explains 40.6% of mental time travel to the past's variance (i.e., $R^2 = 0.41$), which is the highest compared to purchase intentions ($R^2 = 0.16$), loyalty ($R^2 = 0.23$), and word-of-mouth ($R^2 = 0.26$). Therefore, mental time travel to the past seems to explain more word-of-mouth and loyalty intentions than purchase intentions. Next, the model's predictive accuracy is examined by looking at Q^2 values. All values exceed zero for all endogenous constructs providing support for the model's predictive accuracy. Mental time travel to the past has the highest Q^2 (0.32) value, followed by word-of-mouth (0.25), loyalty (0.19), and purchase intentions (0.15).

The structural model assessment involves one-tailed tests with 5,000 bootstrap subsamples (Hair et al., 2019). The results of the bootstrap sampling reveal that the structural relationships express significance and importance through the magnitude of their standardized values (Table 5). Table 5 also depicts the effect sizes (f^2), indicating small, medium, or large effects based on values of 0.02, 0.15, and 0.35, respectively (Krey et al., 2023). Overall, all effect sizes indicate large effects with the exception of the relationships between mental time travel and purchase intentions ($f^2 = 0.19$). The relationship between positive episodic memories and mental time travel to the past reflects the largest effect size ($f^2 = 0.69$).

When analyzing the hypothesized relationships, the results support all proposed hypotheses (Table 5). In line with H1, positive episodic memories positively influence mental time travel to the past ($\beta = 0.64$, $p < 0.01$). In turn, mental time travel to the past significantly influences purchase intentions ($\beta = 0.40$, $p < 0.01$), loyalty intentions ($\beta = 0.48$, $p < 0.01$), and word-of-mouth ($\beta = 0.51$, $p < 0.01$) as proposed in H2a–c.

Finally, PLSPredict with 10-fold and 10 replications is applied to examine the predictive relevance of the model (Shmueli et al., 2019). The root mean squared error values of the endogenous constructs express smaller values for the PLS-SEM method in comparison to the linear regression approach. Therefore, predictive power is confirmed again.

4.6 | Multigroup analysis

4.6.1 | Manipulation check

Before examining the hypothesized differences across experiences, we conducted a one-way analysis of variance to assess the level of cognitive load elicited in each experience (i.e., AR, 360-website, and YouTube video). To measure cognitive load, a 5-item Likert scale was adapted from Geissler et al. (2001). The results indicate that cognitive load significantly differs across the three stimuli ($F = 6.01$, $p < 0.01$). Therefore, all three experiences express varying levels of cognitive load ($M_{AR} = 3.43$; $M_{360} = 3.30$; $M_{Video} = 3.07$).

TABLE 4 Discriminant validity using heterotrait–monotrait ratio for Study 1.

Constructs	1	2	3	4
1. Episodic memories				
2. Mental time travel to the past	0.66 [0.62–0.71]			
3. Purchase intentions	0.42 [0.36–0.48]	0.42 [0.36–0.47]		
4. Loyalty	0.53 [0.47–0.58]	0.51 [0.45–0.56]	0.85 [0.84–0.87]	
5. Word of mouth	0.54 [0.48–0.59]	0.53 [0.48–0.58]	0.50 [0.45–0.56]	0.59 [0.54–0.64]

TABLE 5 Structural model results for Study 1 and Study 2.

	Paths	Standardized estimate	*t* Value	Confidence interval	f^2
Study 1	H1: Episodic memories → Mental time travel to the past	0.64***	29.67	[0.59–0.68]	0.69
Study 1	H2a: Mental time travel to the past → Purchase intentions	0.40***	14.00	[0.35–0.46]	0.19
Study 1	H2b: Mental time travel to the past → Loyalty	0.48***	17.77	[0.43–0.53]	0.30
Study 1	H2c: Mental time travel to the past → Word of mouth	0.51***	19.40	[0.46–0.56]	0.35
Study 2	H4: Mental time travel to the past → Learning	0.51***	14.25	[0.44–0.58]	0.35

***$p < 0.01$.

4.6.2 | Measurement invariance

The first step in MGA involves the assessment of invariance to ensure that construct measurement is similar across the different experiences (Henseler et al., 2016). The measurement invariance of composite models (MICOM) approach encompasses three different steps to test for invariance: (1) configural invariance, (2) compositional invariance, and (3) equality of composite mean values and variances (Henseler et al., 2016). Configural invariance is a nonstatistical step and relies on the inclusion of identical indicators, treatment of indicator data, and algorithm settings across the three experiences. Compositional invariance is assessed via c values as coefficients for indicator effectiveness. All values are close to 1 and within the 95% confidence intervals confirming compositional invariance for all models (Table 6). Finally, composite's equality of mean values and variances across the three experiences are assessed (Henseler et al., 2016). Not all composite's mean value and variances ratio differences are nonsignificant since some values do not fall between the confidence intervals. Consequently, MICOM assessment supports partial measurement invariance and allows MGA to be completed (Ghasemy et al., 2020; Henseler et al., 2016).

4.6.3 | Multigroup results

The multigroup assessment explores the potential differences in the proposed relationships for the model across the different experiences. We conducted PLS-MGA based on 5,000 permutations, two-tailed test at 5% significance level (Basco et al., 2020; Ghasemy et al., 2020). Table 7 depicts the results of the MGA.

For the AR and video experience comparison, significant differences emerge for all proposed relationships. Specifically, stronger relationships are evident in the video experience compared to the AR experience. Therefore, higher levels of cognitive load result in weaker relationships among the constructs in support of H3a–d.

Finally, results further confirm significant differences for all relationships when comparing the 360-website and video experiences. Once again, all relationships are stronger for the video experience consistent with H3a–d. Results confirm that lower levels of cognitive load result in stronger relationships between the constructs.

5 | STUDY 2

5.1 | Study design

Study 2 had 396 participants (see Table A1 in Appendix A for the sample sociodemographic profile) and depicted a toy store brand with a giraffe standing out front. The marketing stimuli were accessible via a Snapchat code and varied in their level of immersion (high and low) and included an AR filter and a static image (please refer to the independent *t*-test results in Section 6.61 for the assessment of immersion).

Participants first watched a video clip that included instructions on using a Snapchat code. Participants were then randomly assigned to one of two experiences (high or low immersion). In the high immersion experience, participants were presented with an augmented reality toy store with a giraffe standing out front. Participants in the low immersion experience were presented with a static image of the same toy store with a giraffe standing out front (see Figure 5).

TABLE 6 Measurement invariance assessment using MICOM (Study 1 and Study 2).

Study	Condition	Composite	c value (=1)	95% Confidence interval	Compositional invariance	Difference of composite's mean value (=0)	95% Confidence interval	Equal mean values	Logarithm of composite's variances ratio (=0)	95% Confidence interval	Equal variances
Study 1	AR—360	Episodic memories	1.00	[1.00–1.00]	Yes	0.10	[−0.18 to 0.17]	Yes	0.05	[−0.18 to 0.17]	Yes
		Mental time travel to the past	1.00	[1.00–1.00]	Yes	0.12	[−0.17 to 0.17]	Yes	−0.16	[−0.17 to 0.18]	Yes
		Purchase intentions	1.00	[1.00–1.00]	Yes	0.19	[−0.18 to 0.16]	No	−0.08	[−0.17 to 0.16]	Yes
		Loyalty	1.00	[0.99–1.00]	Yes	0.17	[−0.19 to 0.17]	Yes	0.09	[−0.23 to 0.23]	Yes
		Word of mouth	1.00	[1.00–1.00]	Yes	0.32	[−0.16 to 0.17]	Yes	0.94	[−0.17 to 0.17]	Yes
Study 1	AR—Video	Episodic memories	1.00	[1.00–1.00]	Yes	0.34	[−0.19 to 0.18]	No	−0.23	[−0.16 to 0.17]	No
		Mental time travel to the past	1.00	[1.00–1.00]	Yes	0.16	[−0.18 to 0.19]	Yes	−0.30	[−0.18 to 0.19]	No
		Purchase intentions	1.00	[1.00–1.00]	Yes	−0.19	[−0.18 to 0.18]	No	−0.36	[−0.17 to 0.18]	No
		Loyalty	1.00	[1.00–1.00]	Yes	0.08	[−0.19 to 0.19]	Yes	−0.42	[−0.21 to 0.22]	No
		Word of mouth	1.00	[1.00–1.00]	Yes	0.45	[−0.19 to 0.19]	No	−0.02	[−0.17 to 0.18]	Yes
Study 1	360—Video	Episodic memories	1.00	[1.00–1.00]	Yes	0.25	[−0.19 to 0.18]	No	−0.28	[−0.18 to 0.19]	No
		Mental time travel to the past	1.00	[1.00–1.00]	Yes	0.04	[−0.20 to 0.18]	Yes	−0.14	[−0.17 to 0.18]	No
		Purchase intentions	1.00	[1.00–1.00]	Yes	−0.36	[−0.19 to 0.19]	No	−0.27	[−0.18 to 0.18]	Yes
		Loyalty	1.00	[0.99–1.00]	Yes	−0.07	[−0.19 to 0.20]	Yes	−0.50	[−0.21 to 0.25]	No
		Word of mouth	1.00	[1.00–1.00]	Yes	0.15	[−0.20 to 0.19]	Yes	−0.12	[−0.20 to 0.19]	Yes
Study 2	AR—Image	Mental time travel to the past	0.99	[0.99–1.00]	Yes	0.38	[−0.19 to 0.22]	No	0.06	[−0.24 to 0.24]	Yes
		Learning	1.00	[1.00–1.00]	Yes	0.60	[−0.20 to 0.20]	No	0.41	[−0.24 to 0.25]	No

TABLE 7 Multigroup comparison results (Study 1 and Study 2).

Study	Condition	Paths	Standardized estimate (Group 1)	Standardized estimate (Group 2)	Difference
Study 1	AR—360	Episodic memories → Mental time travel to the past	0.58	0.62	−0.04^{ns}
		Mental time travel to the past → Purchase intentions	0.31	0.37	−0.06^{ns}
		Mental time travel to the past → Loyalty	0.40	0.41	−0.02^{ns}
		Mental time travel to the past → Word of mouth	0.41	0.50	−0.09^{ns}
Study 1	AR—Video	Episodic memories → Mental time travel to the past	0.58	0.74	−0.16**
		Mental time travel to the past → Purchase intentions	0.31	0.56	−0.25**
		Mental time travel to the past → Loyalty	0.40	0.65	−0.25**
		Mental time travel to the past → Word of mouth	0.41	0.67	−0.26**
Study 1	360—Video	Episodic memories → Mental time travel to the past	0.62	0.74	−0.12*
		Mental time travel to the past → Purchase intentions	0.37	0.56	−0.19**
		Mental time travel to the past → Loyalty	0.41	0.65	−0.24**
		Mental time travel to the past → Word of mouth	0.50	0.67	−0.17**
Study 2	AR—Image	Mental time travel to the past → Learning	0.55	0.40	0.15*

Note: ***$p < 0.01$.

$^{ns}p > 0.10$.

*$p < 0.10$; **$p < 0.05$.

FIGURE 5 Toys experience.

5.2 | Measures

The online surveys for Study 2 included established scales to study the proposed relationships (see Table 3). All items were measured with a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). *Mental time travel to the past*, adapted from Eren (2009), was again measured with six items (α = 0.92). *Learning* was assessed using three items (α = 0.83) from Schlinger (1979).

Since Study 2 also relied on self-reported measures, we implemented the same steps to minimize common method variance as in Study 1 (e.g., separating predictor and criterion variables in the survey; Podsakoff et al., 2003). For the statistical assessment, no single factor accounted for more than 30% of the total variance (Podsakoff et al., 2003), all variance inflation factors for latent variables were below 2.9 (Kock, 2015), and average explained variance of indicators was 0.52 with average method-based variance of 0.12 (Ranaweera & Jayawardhena, 2014). Therefore, procedural steps and statistical assessments do not indicate that common method variance is influencing Study 2.

As in Study 1, we again utilized established scales proposed by Lehmann et al. (2008) to assess previous purchase experience of the perfume, brand awareness, and brand attitude. These variables were controlled for in our analysis, and we again found that they did not significantly impact our model.

5.3 | Analysis

Consistent with Study 1, we employed PLS-SEM using *SmartPLS 3* (Ringle et al., 2015). In line with common procedures, we first assess the measurement model, followed by the structural model (Hair et al., 2019). Once again, MGA includes MICOM to assess the invariance pattern (Basco et al., 2020; Henseler et al., 2016).

5.4 | Measurement model

All outer loadings for the measurement model load on their corresponding constructs and are highly significant ($p < 0.05$), as shown in Table 3. The composite reliability values are above 0.90, while the average variance extracted values are 0.72 and 0.75; therefore, all values exceed common thresholds (Hair et al., 2019). These results support the measurement model's internal consistency and convergent validity.

Regarding discriminant validity, the heterotrait–monotrait ratio value is 0.56 and thus below the conservative threshold of 0.85 (Sarstedt et al., 2017). In addition, the heterotrait–monotrait ratio confidence interval for the construct combination relationship does not include 1 [0.48–0.64]. Overall, the measurement model confirms discriminant validity.

5.5 | Structural model

The structural model assessment involves one-tailed tests with 5,000 bootstrap subsamples (Hair et al., 2019). The results of the bootstrap sampling reveal that the structural relationships express significance and importance through the magnitude of their standardized values (Table 5). The variance inflation factor is 1.00 and below the cutoff of 5, indicating no issue with collinearity (Sarstedt et al., 2017). The model explains 25.8% of the learning's variance (i.e., $R^2 = 0.26$). In addition, the Q^2 value exceeds zero (learning = 0.19) in support of the model's predictive accuracy. Next, Table 5 also depicts the effect size (f^2), indicating a large effect (0.35; Krey et al., 2023).

When analyzing the hypothesized relationships, the result supports the proposed hypotheses (Table 5). In line with H4, mental time travel to the past positively influences learning ($\beta = 0.51$, $p < 0.01$). Finally, PLSPredict indicates that the root mean squared error values of the endogenous construct express a smaller value for the PLS-SEM method in comparison to the linear regression approach (Shmueli et al., 2019). Therefore, predictive power is confirmed.

5.6 | Multigroup analysis

5.6.1 | Manipulation check

An independent *t*-test is used to assess the level of immersion in each condition (i.e., AR, image). Immersion was administered with two items (α = 0.81) from Yim et al. (2017). The results indicate that immersion significantly differs across the two stimuli ($t = 6.62$, $p < 0.01$). Therefore, both experiences express varying levels of immersion ($M_{AR} = 4.88$; $M_{image} = 3.97$).

5.6.2 | Measurement invariance

First, we assessed measurement invariance as a prerequisite to completing MGA. For configural invariance, the study included identical indicators, treatment of indicator data, and algorithm settings across the two experiences. Next, all *c* values are close to 1 and within 95% confidence intervals confirming compositional invariance for all models (Table 6). Finally, not all composite's equality of mean values and variance ratios differences are nonsignificant as some values fall outside the confidence intervals (Henseler et al., 2016). Therefore, MICOM assessment supports partial measurement invariance and allows MGA to be completed (Ghasemy et al., 2020; Henseler et al., 2016).

5.6.3 | Multigroup results

We conducted PLS-MGA based on 5,000 permutations, two-tailed test at 5% significance level (Basco et al., 2020; Ghasemy et al., 2020). For the AR and image experience comparison, significant differences emerge for the proposed relationship (see Table 7). Therefore, higher levels of immersion result in a stronger relationship between mental time travel to the past and learning for the experience with higher immersion (AR). H5 is therefore supported.

6 | GENERAL DISCUSSION

The initial area of focus and contribution of this research is to present a new type of experience to the marketing literature called mental time travel experiences, or MTTEs. Unlike previous types of experiences referenced in the literature, including usage, product, store, shopping, service, brand, and technology experiences, we propose that a delineation of experiences of the mind be added to the extant marketing literature. This research also examines the power of mental time travel experiences to influence future-oriented behaviors and whether the elicitation of positive episodic memories can be used to prime mental time travel experiences. Further, this research explores the role that cognitive load plays in relation to inhibiting mental time travel experiences' effects on behavioral intentions. Finally, this study examines mental time travel to the past and its effect on learning and the role of immersion in enhancing this relationship.

6.1 | Theoretical implications

With regard to priming mental time travel experiences, our findings demonstrate that *positive episodic memories* influence *mental time travel to the past*. All three experiences demonstrated the influencing effect of the elicitation of positive episodic memories on mental time travel to the past regardless of the type of marketing stimulus (i.e., AR, 360-website, or YouTube video). These findings support previous literature on the relationship between episodic memories and mental time travel to the past since episodic memories have been identified as a function of mental time travel (Suddendorf et al., 2009; Tulving, 1993). Powerfully for marketers, episodic memories are normal everyday occurrences (Berntsen et al., 2008) that can be elicited by any retrieval cue (Rugg & Wilding, 2000), and are more often positive than negative in valence (Berntsen & Rubin, 2008). Our findings extend the literature on the ability of positive episodic memories to positively influence mental time travel to the past by showing consistent results across three distinct marketing experiences.

With regard to the ability of mental time travel experiences to positively influence behavioral intentions, findings from this research suggest that mental time travel to the past through the elicitation of positive episodic memories positively influences purchase intentions, loyalty intentions, and word-of-mouth intentions across all three experiences used in this study. This is a critical finding in line with prior literature outside the marketing domain, indicating that mental time travel can foster simulations of possible future scenarios (Berntsen & Jacobsen, 2008; Schacter & Madore, 2016). Prior research espouses this relationship with brain imaging that demonstrates overlapping neural activities when thinking of the past and future (Benoit & Schacter, 2015; Stawarczyk & D'Argembeau, 2015). Furthermore, research of memory-impaired patients demonstrates deficits in the ability to remember one's past are strongly correlated to deficits in the ability to imagine one's future (Hassabis et al., 2007; Klein et al., 2002; Rosenbaum et al., 2005; Tulving, 1985). This research, therefore, lends further support to the ability of mental time travel to the past to positively influence behavioral intentions.

Further, findings confirm a consistent moderation effect of cognitive load on the relationship between positive episodic memories and mental time travel to the past and mental time travel to the past and behavioral intentions. We included cognitive load as a negative moderator in our model due to prior research demonstrating that some marketing experiences can have a propensity to elicit a heavier cognitive load than other forms of experiences (Hsu, 2017), with heavy cognitive load associated with task interference and negative effects on working memory (Suh & Prophet, 2018). As such, we hypothesized that heightened cognitive load would have an inhibiting effect on the ability of positive episodic memories to influence mental time travel to the past and for mental time travel to the past to influence behavioral intentions. Indeed, our findings support this assertion as the experience with the lowest amount of cognitive load (i.e., the video) had the strongest relationships between episodic memories and mental time travel to the past as well as mental time travel to the past and behavioral intentions. In comparison, the experience that elicited the most cognitive load (i.e., the AR), had the weakest relationships. Further, MGA demonstrates that there are significant differences for the path relationships between positive episodic memories and mental time travel to the past and mental time travel to the past and behavioral intentions when comparing the experience with the lowest amount of cognitive load (i.e., the video) with the experiences that induced higher amounts of cognitive load (i.e., the AR and 360 stimuli). Thus, this research extends the extant literature on the diminishing effects that cognitive load can have on the elicitation of mental time travel experiences and important brand outcomes including purchase, loyalty, and word-of-mouth intentions.

Further results from this research suggest that mental time travel to the past can play a key role in influencing learning. We included learning in our conceptual model due to prior research indicating that the human mind engages in a reconstruction of previous events to process the familiar and unfamiliar (Schomaker & Meeter, 2015; Tulving & Kroll, 1995) and that in this reconstruction of events, humans undertake mental time travel which is a catalyst for cognitive processing and learning (Garcia-Pelegrin et al., 2021; Suddendorf & Corballis, 2007). We, therefore, hypothesized that mental time travel to the past could be a key enabler of learning as it would allow individuals to reflect on their personal past experiences and to identify patterns and connections to learn about their environments. Indeed, the results from this study suggest that whether exposed to augmented reality or a static image, mental time travel to the past is a significant influencing factor for learning as our results indicated a strong effect based on Cohen's criteria (1988).

Finally, we examined the effect that a state of immersion could have on the relationship between mental time travel to the past and learning. We did so as research demonstrates that higher states of immersion have been associated with enhanced information processing, learning (Brannon Barhorst et al., 2021; Georgiou & Kyza, 2018), greater understanding of material (Dede, 2009), and the propensity of a state of full immersion in virtual environments to foster mental time travel (Hassabis et al., 2007), which can support learning (Garcia-Pelegrin et al., 2021; Suddendorf & Corballis, 2007). Results from this study pertain that immersion can have a positive moderating effect on the relationship between mental time travel to the past and learning, as the condition with the highest state of immersion had a stronger effect between mental time travel to the past and learning. As such, this is a key finding that extends the literature on mental time travel to the past and the strengthening effects of immersion on learning.

6.2 | Practical implications

A few important implications for marketing managers and designers of marketing experiences come to the fore as a result of this research. First, this research provides some initial empirical evidence of the capability of marketing campaign stimuli to elicit mental time travel experiences and the power that mental time travel experiences have in fostering behavioral intentions. Accordingly, marketing experiences should incorporate elements that trigger a retrieval cue to remind consumers of positive experiences from their past and to facilitate the remembrance of personally experienced events associated with particular times or places to activate mental time travel experiences.

Additionally, marketing creative assets should incorporate cues that can help mental time travelers to see, feel, and hear previous experiences in their mind as a sense of mental time travel can foster important behavioral intentions. For example, digital marketing campaign assets such as augmented reality, videos, and 360-websites that include vivid colors and auditory cues could enhance mental time travel's effect on behavioral intentions and learning. Further, consideration should be given to the extent of cognitive load of a stimulus in the design of mental time travel experiences. This study indicates that the level of cognitive load is linked to the amount of influence that positive episodic memories can have on mental time travel to the past and mental time travel to the past's influence on behavioral intentions. Hence, although experiences such as augmented reality have been heralded as key technologies in the metaverse, marketers must be careful when designing such assets as our study demonstrates that increased cognitive load can have an inhibiting effect on the relationship between mental time travel to the past and behavioral intentions. On the other hand, our study also demonstrates that a state of immersion elicited by AR can have an enhancing effect on the relationship between mental time travel to the past and learning when compared to a static image. Thus, cognitive load and immersion need to be optimally calibrated in the design of mental time travel experiences.

6.3 | Limitations and future research

Limitations associated with this research may pave the way for future research. First, focusing on two marketing campaigns and industries (i.e., perfume and toys) allowed us to examine our conceptual model across a range of marketing experiences while keeping the content (brand of perfume within a snow globe and toy store) constant. However, future studies could examine other products and industries to increase the generalizability of the current results. Another limitation of the study concerns the range of marketing experiences examined. Due to the availability of experiences for these campaigns, we examined two Snapchat AR experiences, a 360-website, a YouTube video, and a static image. Future studies could examine other available stimuli executed through various technologies (e.g., VR, smart glasses, metaverse) to determine whether similar outcomes occur. Finally, a further limitation of the study concerns the location of the experiments (the UK). Given that marketing experiences are available around the world, research could undertake a similar analysis with consumers in other countries to determine if our results hold.

DATA AVAILABILITY STATEMENT

Research data are not shared.

ORCID

Jennifer Brannon Barhorst https://orcid.org/0000-0002-5827-806X
Nina Krey https://orcid.org/0000-0002-1565-3130
Graeme McLean https://orcid.org/0000-0003-3758-5279

REFERENCES

Addis, D. R. (2020). Mental time travel? A neurocognitive model of event simulation. *Review of Philosophy and Psychology*, *11*, 233–259.

Atance, C. M., & O'Neill, D. K. (2001). Episodic future thinking. *Trends in Cognitive Sciences*, *5*(12), 533–539.
Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences*, *22*(4), 577–660.
Basco, R., Hernández-Perlines, F., & Rodríguez-García, M. (2020). The effect of entrepreneurial orientation on firm performance: A multigroup analysis comparing China, Mexico, and Spain. *Journal of Business Research*, *113*, 409–421.
Becker, L., & Jaakkola, E. (2020). Customer experience: Fundamental premises and implications for research. *Journal of the Academy of Marketing Science*, *48*, 630–648.
Benoit, R. G., & Schacter, D. L. (2015). Specifying the core network supporting episodic simulation and episodic memory by activation likelihood estimation. *Neuropsychologia*, *75*, 450–457.
Berntsen, D., & Jacobsen, A. S. (2008). Involuntary (spontaneous) mental time travel into the past and future. *Consciousness and Cognition*, *17*(4), 1093–1104.
Berntsen, D., & Rubin, D. C. (2008). The reappearance hypothesis revisited: Recurrent involuntary memories after traumatic events and in everyday life. *Memory & Cognition*, *36*(2), 449–460.
Biernat, M., Kobrynowicz, D., & Weber, D. L. (2003). Stereotypes and shifting standards: Some paradoxical effects of cognitive load. *Journal of Applied Social Psychology*, *33*(10), 2060–2079.
Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand experience: What is it? How is it measured? Does it affect loyalty? *Journal of Marketing*, *73*(3), 52–68.
Brannon Barhorst, J., McLean, G., Shah, E., & Mack, R. (2021). Blending the real world and the virtual world: Exploring the role of flow in augmented reality experiences. *Journal of Business Research*, *122*, 423–436.
Burgess, R. G. (2003). Elements of sampling in field research, *Field research* (pp. 127–133). Routledge.
Chandler, J. D., & Lusch, R. F. (2015). Service systems: A broadened framework and research agenda on value propositions, engagement, and service experience. *Journal of Service Research*, *18*(1), 6–22.
Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
D'Argembeau, A., & Van der Linden, M. (2004). Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: Influence of valence and temporal distance. *Consciousness and Cognition*, *13*(4), 844–858.
D'Argembeau, A., & Van der Linden, M. (2006). Individual differences in the phenomenology of mental time travel: The effect of vivid visual imagery and emotion regulation strategies. *Consciousness and Cognition*, *15*(2), 342–350.
Dede, C. (2009). Immersive interfaces for engagement and learning. *Science*, *323*(5910), 66–69.
Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J., Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A. S. … Wirtz, J. (2023). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology & Marketing*, *40*, 750–776.
eMarketer. (2021). *Worldwide digital ad spending*. https://www.emarketer.com/content/worldwide-digital-ad-spending-2021
Epstude, K., & Peetz, J. (2012). Mental time travel: A conceptual overview of social psychological perspectives on a fundamental human capacity. *European Journal of Social Psychology*, *42*(3), 269–275.
Eren, A. (2009). Self-efficacy beliefs and mental time travel ability: Uncovering a hidden relationship in educational settings. *Learning and Individual Differences*, *19*(4), 513–517.
Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addison-Wesley.
Garcia-Pelegrin, E., Wilkins, C., & Clayton, N. S. (2021). The ape that lived to tell the tale. the evolution of the art of storytelling and its relationship to mental time travel and theory of mind. *Frontiers in Psychology*, *12*, 4623.
Geissler, G., Zinkhan, G., & Watson, R. (2001). Web home page complexity and communication effectiveness. *Journal of the Association for Information Systems*, *2*(1), 1–48.
Georgiou, Y., & Kyza, E. A. (2018). Relations between student motivation, immersion and learning outcomes in location-based augmented reality settings. *Computers in Human Behavior*, *89*, 173–181.
Ghasemy, M., Teeroovengadum, V., Becker, J. M., & Ringle, C. M. (2020). This fast car can move faster: A review of PLS-SEM application in higher education research. *Higher Education*, *80*(6), 1121–1152.
Grewal, D., Levy, M., & Kumar, V. (2009). Customer experience management in retailing: An organizing framework. *Journal of Retailing*, *85*(1), 1–14.
Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24.
Hassabis, D., Kumaran, D., Vann, S. D., & Maguire, E. A. (2007). Patients with hippocampal amnesia cannot imagine new experiences. *Proceedings of the National Academy of Sciences of the United States of America*, *104*(5), 1726–1731.
Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International Marketing Review*, *33*(3), 405–431.
Herz, M., & Brunk, K. H. (2017). Conceptual advances in consumers' semantic and episodic brand memories: A mixed methods exploration. *Psychology & Marketing*, *34*(1), 70–91.
Hilken, T., Keeling, D. I., Chylinski, M., de Ruyter, K., Golf Papez, M., Heller, J., & Alimamy, S. (2021). Disrupting marketing realities: A research agenda for investigating the psychological mechanisms of next-generation experiences with reality-enhancing technologies. *Psychology & Marketing*, *39*(8), 1660–1671.
Hoch, S. J. (2002). Product experience is seductive. *Journal of Consumer Research*, *29*(3), 448–454.
Hoch, S. J., & Ha, Y.-W. (1986). Consumer learning: Advertising and the ambiguity of product experience. *Journal of Consumer Research*, *13*(2), 221–233.
Hoffman, D. L., & Novak, T. P. (2018). Consumer and object experience in the internet of things: An assemblage theory approach. *Journal of Consumer Research*, *44*(6), 1178–1204.
Holbrook, M. B. (2000). The millennial consumer in the texts of our times: Experience and entertainment. *Journal of Macromarketing*, *20*(2), 178–192.
Holbrook, M. B., & Hirschman, E. C. (1982). The experiential aspects of consumption: Consumer fantasies, feelings, and fun. *Journal of Consumer Research*, *9*(2), 132–140.
Hsu, T. C. (2017). Learning English with augmented reality: Do learning styles matter? *Computers & Education*, *106*, 137–149.
Hui, M. K., & Bateson, J. E. (1991). Perceived control and the effects of crowding and consumer choice on the service experience. *Journal of Consumer Research*, *18*(2), 174–184.
Hutter, K., & Hoffmann, S. (2014). Surprise, surprise. Ambient media as promotion tool for retailers. *Journal of Retailing*, *90*(1), 93–110.
Kalyuga, S., Ayres, P., Chandler, P., & Sweller, J. (2003). The expertise reversal effect. *Educational Psychologist*, *38*(1), 23–31.
Kerin, R. A., Jain, A., & Howard, D. J. (1992). Store shopping experience and consumer price-quality-value perceptions. *Journal of Retailing*, *68*(4), 376.
De Keyser, A., Lemon, K. N., Klaus, P., & Keiningham, T. L. (2015). A framework for understanding and managing the customer experience. *Marketing Science Institute Working Paper Series*, *85*(1), 15–121.
Klein, S. B., Loftus, J., & Kihlstrom, J. F. (2002). Memory and temporal experience: The effects of episodic memory loss on an amnesic patient's ability to remember the past and imagine the future. *Social Cognition*, *20*(5), 353–379.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, *11*(4), 1–10.
Krey, N., tom Dieck, M. C., Wu, S., & Fountoulaki, P. (2023). Exploring the influence of touch points on tourist experiences at crisis impacted destinations. *Journal of Travel Research*, *62*(1), 39–54.
Kumar, H., Gupta, P., & Chauhan, S. (2023). Meta-analysis of augmented reality marketing. *Marketing Intelligence & Planning*, *41*(1), 110–123.
Kumar, V. (2018). Transformative marketing: The next 20 years. *Journal of Marketing*, *82*(4), 1–12.
Lehmann, D. R., Keller, K. L., & Farley, J. U. (2008). The structure of survey-based brand metrics. *Journal of International Marketing*, *16*(4), 29–56.
Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, *80*(6), 69–96.
Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. *MIS Quarterly*, *31*, 59–87.
Marchegiani, C., & Phau, I. (2013). Development and validation of the personal nostalgia scale. *Journal of Marketing Communications*, *19*(1), 22–43.
McCarthy, J., & Wright, P. (2004). Technology as experience. *Interactions*, *11*(5), 42–43.
Mishra, A., Shukla, A., Rana, N. P., & Dwivedi, Y. K. (2021). From "touch" to a "multisensory" experience: The impact of technology interface and product type on consumer responses. *Psychology & Marketing*, *38*(3), 385–396.
Novak, T. P., Hoffman, D. L., & Duhachek, A. (2003). The influence of goal-directed and experiential activities on online flow experiences. *Journal of Consumer Psychology*, *13*(1–2), 3–16.
Park, S. S., Tung, C. D., & Lee, H. (2021). The adoption of AI service robots: A comparison between credence and experience service settings. *Psychology & Marketing*, *38*(4), 691–703.
Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903.
Ranaweera, C., & Jayawardhena, C. (2014). Talk up or criticize? Customer responses to WOM about competitors during social interactions. *Journal of Business Research*, *67*(12), 2645–2656.
Rasmussen, K. W., & Berntsen, D. (2014). "I can see clearly now": The effect of cue imageability on mental time travel. *Memory & Cognition*, *42*(7), 1063–1075.
Ringle, C. M., & Sarstedt, M. (2016). Gain more insight from your PLS-SEM results: The importance-performance map analysis. *Industrial Management & Data Systems*, *116*(9), 1865–1886.
Ringle, C. M., Wende, S., & Becker, J. M. (2015). *SmartPLS 3*. SmartPLSGmbH. http://www.smartpls.com
Rosenbaum, R. S., Köhler, S., Schacter, D. L., Moscovitch, M., Westmacott, R., Black, S. E., Gao, F., & Tulving, E. (2005). The case of KC: Contributions of a memory-impaired person to memory theory. *Neuropsychologia*, *43*(7), 989–1021.
Rugg, M. D., & Wilding, E. L. (2000). Retrieval processing and episodic memory. *Trends in Cognitive Sciences*, *4*(3), 108–115.
Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), *Handbook of market research*. Springer.
Schacter, D. L., Addis, D. R., Hassabis, D., Martin, V. C., Spreng, R. N., & Szpunar, K. K. (2012). The future of memory: remembering, imagining, and the brain. *Neuron*, *76*(4), 677–694.
Schacter, D. L., & Madore, K. P. (2016). Remembering the past and imagining the future: Identifying and enhancing the contribution of episodic memory. *Memory Studies*, *9*(3), 245–255.
Schlinger, M. J. (1979). A profile of responses to commercials. *Journal of Advertising Research*, *19*, 37–46.
Schmitt, B. (2009). The concept of brand experience. *Journal of Brand Management*, *16*, 417–419.
Schomaker, J., & Meeter, M. (2015). Short-and long-lasting consequences of novelty, deviance and surprise on brain and cognition. *Neuroscience and Biobehavioral Reviews*, *55*, 268–279.
Shahid, S., Paul, J., Gilal, F. G., & Ansari, S. (2022). The role of sensory marketing and brand experience in building emotional attachment and brand loyalty in luxury retail stores. *Psychology & Marketing*, *39*(7), 1398–1412.
Shapiro, L. (2010). *Embodied cognition*. Routledge.
Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, *53*(11), 2322–2347.
Simone, N. (1965). I put a spell on you. *Spotify*. https://open.spotify.com/track/0sjxRg1VlYfx4YG7uxurrq?si=022b3b7c23c040c6
Slater, M. (2009). Place illusion and plausibility can lead to realistic behaviour in immersive virtual environments. *Philosophical Transactions of the Royal Society, B: Biological Sciences*, *364*, 3549–3557.
Stawarczyk, D., & D'Argembeau, A. (2015). Neural correlates of personal goal processing during episodic future thinking and mind-wandering: An ALE meta-analysis. *Human Brain Mapping*, *36*(8), 2928–2947.
Suddendorf, T., Addis, D. R., & Corballis, M. C. (2009). Mental time travel and the shaping of the human mind. *Philosophical Transactions of the Royal Society, B: Biological Sciences*, *364*(1521), 1317–1324.
Suddendorf, T., & Corballis, M. C. (2007). The evolution of foresight: What is mental time travel, and is it unique to humans? *Behavioral and Brain Sciences*, *30*(3), 299–313.
Suh, A., & Prophet, J. (2018). The state of immersive technology research: a literature analysis. *Computers in Human Behavior*, *86*, 77–90.
Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, *12*(2), 257–285.
Szpunar, K. K. (2010). Episodic future thought: an emerging concept. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, *5*(2), 142–162.
Thoma, D., & Wechsler, J. (2021). Older and more personal: Stronger links between brand-name recall and brand-related autobiographical memories in older consumers. *Psychology & Marketing*, *38*(9), 1384–1392.
Tonietto, G. N., & Barasch, A. (2020). Generating content increases enjoyment by immersing consumers and accelerating perceived time. *Journal of Marketing*, *85*(6), 83–100.
Tulving, E. (1972). Episodic and semantic memory. *Organization of Memory*, *1*, 381–403.
Tulving, E. (1983). Ecphoric processes in episodic memory. *Philosophical Transactions of the Royal Society of London. B: Biological Sciences*, *302*(1110), 361–371.
Tulving, E. (1985). Memory and consciousness. *Canadian Psychology/Psychologie Canadienne*, *26*(1), 1–12.
Tulving, E. (1993). What is episodic memory? *Current Directions in Psychological Science*, *2*(3), 67–70.
Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, *53*(1), 1–25.
Tulving, E., & Kroll, N. (1995). Novelty assessment in the brain and long-term memory encoding. *Psychonomic Bulletin & Review*, *2*(3), 387–390.

Wheeler, M. A., Stuss, D. T., & Tulving, E. (1997). Toward a theory of episodic memory: The frontal lobes and autonoetic consciousness. *Psychological Bulletin*, *121*(3), 331–354.

Yim, M. Y. C., Chu, S. C., & Sauer, P. L. (2017). Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. *Journal of Interactive Marketing*, *39*, 89–103.

Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, *60*(2), 31–46.

How to cite this article: Barhorst, J. B., Krey, N., & McLean, G. (2023). Exploring mental time travel experiences and their influence on behavioral intentions and learning. *Psychology & Marketing*, 1–19. https://doi.org/10.1002/mar.21828

APPENDIX A

See Table A1.

TABLE A1 Sample demographics for Study 1 and Study 2.

	Study 1		Study 2	
Variables	**Number**	**Percentage**	**Number**	**Percentage**
Gender				
Female	462	66	216	56
Male	234	34	166	42
Prefer not to say	1	0.1	0	0
Nonbinary	4	0.6	8	2
Total	**701**	**100**	**390**	**100**
Age				
18–24	236	34	180	45
25–34	187	27	150	38
35–44	84	12	39	10
45–54	72	9	19	5
55–64	75	11	8	2
65+	47	7	0	0
Total	**701**	**100**	**396**	**100**
Education				
No formal education	6	1	8	2
Bachelor's degree	262	37	161	41
Master's degree	71	10	33	8
Ph.D.	19	3	6	1
Professional qualification	17	2	10	3
Completed high school	125	18	107	27
College qualification	201	29	71	18
Total	**701**	**100**	**396**	**100**