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This is an accepted manuscript of an article published by Taylor & Francis in Memory,
DOI: 10.1080/09658211.2020.1811874

The final definitive version is available online:

<https://doi.org/10.1080/09658211.2020.1811874>

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Remembering Cultural Experiences: lifespan distributions, richness and content of autobiographical memories of museum visits

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Remembering Cultural Experiences: lifespan distributions, richness and content of autobiographical memories of museum visits

Little is known about our autobiographical memories for cultural events. This represents an opportunity for cultural institutions such as museums, as examination of visitor memories is one way in which they can seek to understand the long-term impact they may have on their visitors. This research applied a coding model developed from autobiographical memory theory to analysis of participants' memories for museum visits, considering the distribution of memories across the life span, types of memories and content. Differences between visitor groups (age, visit frequency) were also considered. Findings showed a strong recency effect in the life-span distribution, suggesting the importance of social sharing in memories of cultural experience. Analysis of content showed a hierarchy of information that was present in museum memories. Knowledge acquired during the event of the visit was important, as was contextualising information whereby visitors situated the memory within their autobiographical knowledge and chronology. Emotions and thoughts were also salient. Visitor differences had minimal impact on content, with the exception of some effects that were consistent with the literature on memory and ageing. This research develops understanding of autobiographical memories for cultural experiences and provides insight to museums, with practical implications in terms of understanding visitors' experiences.

Keywords: autobiographical memory, museums, cultural experience, identity, visitor studies

Introduction

The place of museums within our cultural environment is shifting. They are increasingly being tasked with adding value to the lives of the community by enhancing social inclusion, supporting social mobility and facilitating social cohesion (e.g. DCMS, 2001; Golding, 2016; Mendoza, 2017; Sandell, 1998). At the same time, museums have lost the popularity and importance as leisure activities that they once had, as other visitor attractions such as cinema and professional football gained force in the early twentieth century (Crossick, 2018). In the nineteenth century, museums provided the masses with an important form of access to

different worlds, different cultures, and different times. In today's information age, museums must actively compete for visitors' time, budget and attention with many other leisure activities. As such, they operate within an 'experience economy', whereby visitors may seek to *learn* within an educational experience, *go* and *do* within an escapist experience, *enjoy* as part of an entertainment experience or simply just *be* as part of an aesthetic experience (Pine & Gilmore, 2011). Although the numbers of museum visitors are increasing in many sectors, museums are failing to diversify their audiences, and are seen by many sectors of the community as largely irrelevant and uninteresting (Mendoza, 2017). This stands in stark contrast to museums' desire to drive empowerment, at an individual, community and ultimately, societal level (Sandell, 2003). Museums cannot achieve their ambitious social empowerment agendas (Sandell, 2003) unless they speak to all members of the community.

Over the past 50 years, museums have increasingly sought to become more visitor-focused (Selwood, 2018). Overall, it could be said that a new museology is shifting the focus from objects and collections, to ideas, experiences and visitors (O'Neill, Selwood & Swenson, 2019, McCall & Gray, 2014). Nevertheless, it is only in recent decades that visitor numbers and profiles have become central to museums and their policy development (Crossick, 2018). However, whilst the importance of trying to understand cultural engagement is fully recognised, cultural policy has neglected to address the nature of museum experiences (Crossick, 2018). Whilst many museums gather visitor data, the reliance on visitor numbers and profiles brings little understanding about people's experiences (Crossick, 2018), and what the lasting impact of those experiences may be. Researchers have recognised that there are broad motivations for visiting a museum (Falk, 2016), including exploration, facilitating, experience seeking, professional or personal interest and relaxation. Thus, whilst demographic data might shed light on who walks in through the museum's door, with observable patterns regarding age, ethnicity, education and income emerging, they are

unable to address the impact and importance of the diverse components that make up a museum visit. Indeed, it has been suggested that the use of demographics may not only fail to provide meaningful data, they may in fact provide only a false sense of knowing visitors (Falk, 2013). There is therefore a pressing need for museums to go beyond analysis of visitor demographics and to explore methods of evaluation that help them to understand the nature of the museum experience. Up to now, museums have not had the tools to do this. Looking at visitors' memories of a museum visit, in collaboration with psychologists and underpinned by psychological understanding around autobiographical memory, is a key way of understanding both the nature and impact of cultural experience.

Museums arguably seek to generate lasting autobiographical memories for their visitors. Autobiographical memories are personal records of our lived experience, and are constructed and reconstructed throughout the life span (Bluck, 2017, Conway, 2005, Kihlstrom, 2009). They are fundamental to our everyday functioning, forming the bedrock of our concept of self (Conway, 2005, Bluck, 2017, Bluck & Liao, 2013), our social interactions (Alea & Bluck, 2003) and our future thinking (Bluck, 2017, Conway, Loveday & Cole, 2016, Eardley & Pring, 2006). As museums are experiential institutions that want to engage their visitors and have an enduring impact, autobiographical memories for museum visits can provide one way of exploring the impact of a museum visit. Understanding the nature of this impact can inform on multiple aspects of museum practice, such as exhibition design, programme management, event marketing and staff engagement with visitors. Although memorability has been identified as a valuable way to examine the enduring value of a visit (Falk & Dierking, 1990, Falk & Dierking, 1997), up to now there has been limited empirical work exploring autobiographical memories in the museum context (e.g. Anderson, 2003; Anderson & Shimizu, 2007a; Anderson & Shimizu, 2007b; Medved, Cupchik, & Oatley, 2004; Medved & Oatley, 2000). Research has considered the retention of semantic

information such as details of exhibits (Medved & Oatley, 2000) or the presence of and interactions between memory vividness, affect, rehearsal, and visit motivations (Anderson & Shimizu, 2007a). However, although previous studies have been informed by memory theory, researchers have called for broader agreement regarding key measures that could guide museum memory research, in the hope that generalisation about impact would become possible (Anderson, Storksdieck, & Spock, 2007). To the best of our knowledge, there has not yet been a systematic exploration of autobiographical memories of museum visits, rendering this approach both crucial and timely.

Furthermore, the importance of memory in the museum context is multifaceted. Not only do museums want visitors to form lasting memories of their experiences in the museum, but museums also wish to preserve and share memories through presenting narratives of other times, places and cultures to members of the public. As such, museums aim to become places of recollection, which are driven as much by narratives and performances as by the objects within the collections (Arnold-de Simone, 2013). Curatorial practices therefore try to create museum environments that bring visitors face to face with the memories of others past and present, and which thereby promote empathy and understanding (Arnold-de Simone, 2013). In this sense, museums tell stories (Bedford, 2001) much as works of literature, film, theatre or music may do, and they have the ability to promote cultural transmission – passing stories on from the past into the present, or from one group of people to another.

Conversations and social interactions relating to cultural experience, and the narratives conveyed by cultural institutions such as museums, are one way in which memories of such experiences are rehearsed and revisited. It is also one way in which museums' stories will enter the array of environmental and cultural stimuli that contribute to socially constructed schema. Socially constructed schema grow from our relationships with others, religion, or education and from the narratives of our culture which we encounter in the

media, literature, music and cultural institutions (Conway, 2005), and such schema inform our understanding of our personal and collective identities. Therefore, through social interaction and conversations about recent cultural experience, museums' narratives and museum experiences may act upon visitors' sense of identity. Museum research and practice thus recognises that museums have a role to play in various aspects of a visitor's identity (Falk, 2006, 2013, 2016). Studying autobiographical memories of museum visits offers a unique opportunity to explore not only the impact of museums across the lifespan, but also the potential role of museums in cultural transmission and social cohesion.

Research on the distribution of autobiographical memories across our lifespans suggests that they typically fade over time, becoming less vivid and accessible (Conway & Pleydell-Pearce, 2000). However, some periods of the life span appear resistant to this, with the research literature consistently documenting a robust concentration of memories, or 'remembrance bump,' between the ages of 10-30 (Conway, Wang, Hanyu, & Haque, 2005; Janssen, Chessa, & Murre, 2006, Munawar, Kuhn & Haque, 2018). In other words, a larger proportion of memories are recalled during this crucial period than would be expected based on the general pattern of decay over time. It has been argued that this relates to the period when identity formation is strongest (Conway & Pleydell-Pearce, 2000). Examining the lifespan distribution of autobiographical memories could provide important understanding about the impact of museum visits upon a visitor.

Museums seek to engage each of their visitors as individuals, each with their own backgrounds, interests and needs. Nevertheless, in order to understand visitors, there is a trend towards segmentation based on motivations for visiting, for example, explorers, facilitators, experience seekers, professional/hobbyists and rechargers (Falk, 2016). From a cognitive perspective, the underlying memory processes of these segmentations are unlikely to differ. However, there are some factors which could result in differences in the

autobiographical memories of visitors. Autobiographical memory research generally suggests that older people recall fewer specific memories (Levine, Svoboda, Hay, Winocur, & Moscovitch, 2002) with fewer sensory perceptive details (Piolino, Desgranges, Benali, & Eustache, 2002; Piolino, Desgranges, & Eustache, 2009). Specific memories are memories of one particular episode that occurred on one particular day, in other words, information that has a spatial and temporal context (Conway, 2009). In contrast, general memories are memories which include aspects drawn from a broader period of time, or a series of visits to a particular place. Therefore, people who visit museums frequently could be expected to report 'reisodes', where many similar events converge in general memories (Cohen & Conway, 2007). Conversely, unusual events are often better recalled (Cohen & Conway, 2007) and may be more vivid, meaning that infrequent visitors may have more specific memories and memories that are richer in detail. However, as frequent visitors attend museums more often, they may have more specific memories as there may be simply more memories of visits available to be accessed. Events that are personally important, emotional or surprising are also likely to be better remembered (Cohen & Conway, 2007) and when integrated with important autobiographical knowledge, the resulting memories may indicate moments of transition, first time or self-defining experiences. A detailed understanding of the content of autobiographical memories is important to access some of these potential patterns, and could inform both on the theoretical nature of autobiographical memory and on the nature of a museum experience.

In addition to examining the distribution of memories across the lifespan, it is important to examine the content of autobiographical memories for museum visits, as a tool for understanding the nature of a museum experience. Autobiographical memory research has developed coding systems to address the content of autobiographical memories and the prevalence of certain features, such as details of time, place, happenings, thoughts/emotions,

semantic information and perceptual information from across modalities (Levine et al., 2002). The coding system used in this research combines the coding for content used by autobiographical memory researchers (Loveday & Conway, 2011; Levine et al., 2002) with the understanding of types of memories (general/specific/special) set out by Conway & Pleydell-Pearce (2000).

This study addressed three research questions. The first examined whether memories for museum visits would follow the theoretical life-span curve. The second question explored the possible impact of visitor differences on memory for museum visits. Within this, we examined a) the impact of visit frequency on the distribution of the reminiscence bump; and the impact of age and visit frequency on: b) the specificity of autobiographical memories, and c) on the occurrence of special memories. Thirdly, we examined what elements make up the content of a memory for a museum visit, including the prevalence of certain types of memory details, and we also considered the richness of memories. The research explored whether the visitor characteristics of age and visit frequency would impact on the content or level of richness of the memories.

Method

Participants

Forty young participants (30 years and under) and forty senior participants (40 years and over) were recruited via the University of Westminster's Psychology Research Participation Scheme for undergraduate students, through the University of the Third Age, and through snowball sampling. Participants were classified into frequent and infrequent visitors, based on their museum visiting habits in the past five years. Using a median split, those who currently visited museums at least once every six months were classified as frequent museum visitors. Those who visited museums once a year or less were classified as infrequent museum visitors.

There was no difference in the ages of the senior participants ($t=.015$, $df=38$, $p=.90$).

There was a difference in the ages of the young participants, with frequent visitors being significantly older than infrequent: ($t=2.26$, $df=38$, $p=.03$).

		age	gender
Young	infrequent visitors	19.7 (1.34)	18 females, 2 males
	frequent visitors	21.6 (3.41)	18 females, 2 males
Senior	infrequent visitors	57.9 (13.43)	16 females, 4 males
	frequent visitors	58.5 (11.24)	18 females, 2 males

Table 1: Mean (SD) ages and genders of participant groups by age and visit frequency

For the research question exploring life-span distribution, only participants aged 40 and over were included. Two participants provided only general memories and was excluded. Of the resulting sample of 38 participants, there were 20 frequent (mean age in years=58.15, $SD=11.70$), 18 infrequent (mean age in years= 55.39, $SD=11.72$) museum visitors. A t -test confirmed no significant differences in the ages of the frequent and infrequent visitors: ($t=0.73$, $df=36$, $p=.47$).

The study was carried out in line with British Psychological Society ethical guidelines, and was approved by the University of Westminster's Psychology Ethics Committee. All participants gave informed consent and were debriefed upon completion.

Materials

Autobiographical Memory Questionnaire:

The questionnaire invited participants to share up to 6 memories of museum or gallery visits. 'Museums and galleries' was left open for participants' own interpretation and not qualified or restricted. Participants were instructed to just select the first 6 memories that came to mind, or as many as they were able to recall. The general probes used to develop memories were 'please tell us about up to 6 museum or gallery visits that you remember... Please just select the 6 that come to your mind now.' Participants were then prompted to provide at least three specific things that they remembered about the experience, such as something about the museum or gallery itself, its artworks or exhibitions, a feeling they experienced, a conversation they had, or any specific moment they recalled about the visit. They were told that these things could be clear events, or just fragments of a memory. They were also asked to give the approximate age they were at the time of all visits recalled.

Museum Experience Questionnaire

Participants were asked about their museum visiting habits, past and present, including the life period in which they visited museums most frequently (please contact the corresponding author for a copy of the questionnaire).

Procedure

The questionnaire was hosted online on the Qualtrics platform and was distributed via an email link. There was no time limit, and participants could select where they completed the questionnaire. Upon completion, participants were debriefed and thanked for their time.

Data Coding

Each individual autobiographical museum memory provided by a participant was categorised across two domains – specificity and importance. All memories were then analysed for

content. Coding drew on the work of Levine et al., (2002) and Conway & Pleydell-Pearce, (2000) and Conway (2009).

Memory Specificity

Each memory was scored in its entirety as either a non-memory, a general memory, or a specific memory (see Conway, 2009). Where memories included general and specific elements, memories were coded as specific. Changes in tense were taken as an indicator that a memory was moving from a general memory to a specific moment. Memory fragments with no verbs were by definition classed as general, as there was no verb construction to link detail to any specific moment. In instances where tense and/or content could not determine specificity, then these types of memories were classed as general. Non-memories were excluded from further analysis. Specific memories only were included in analysis of the reminiscence bump.

Special Memories

All memories were coded for importance (special/non-special). ‘Special’ memories included memories that had an emotional element that indicated an enduring relevance and salience for the participant (Conway & Pleydell-Pearce, 2000), such as ‘first time’, ‘self-defining’, ‘culture-defining’ or ‘transitional’ memories. All other memories were categorised as ‘Non-special.’

Memory Content

Participants were asked to recall memories for a museum visit, in order to examine the broader museum ‘experience’. As such, we did not create a distinction between ‘internal’ and ‘external’ components to that event (Levine et al., 2002). This allowed for the presence of any type of content within a general or a specific memory to be considered as part of the museum experience. This was important from a museum’s perspective, as general memories rich with detail would also be of interest and importance, as they would also indicate impact.

The content categories were broadly developed from the coding system of Levine et al. (2002). General and specific memories were broken down into discrete segments and scored for content. Participants' counts for each category were summed and a percentage calculated for each type of content that they recalled.

A segment of text was based on units of meaning, and could range from a single word to an entire sentence, as proposed by Levine et al. (2002). However, the codes were mutually exclusive, so once a segment was coded it was not considered for inclusion in another category. However, multiple codes could be applied within one sentence, as it would typically be made up of multiple segments each with distinct units of meaning. The texts were coded and 10% of the sample underwent a second, independent coding. The second-coder was given detailed instructions, including examples (available from the corresponding author, upon request). Inter-rater agreement was 95.66% for the sample. Scoring for content in this research addressed categories: 'event-specific acquired knowledge', 'context/time', 'place', 'person/social interactions', 'event', 'sensory-perceptive', 'emotions' and 'cognitions.'

Event-Specific Acquired Knowledge: this category included details internal to the event (visit), for example objects or artworks seen and details about them. This category also included physical features of the exhibition, its displays or facts/concepts recalled. This category overlaps with Levine et al., (2002)'s semantic category. However, within Levine et al.'s (2002) coding, 'semantic' is defined as external to the event. Within the context of the museum visit, and therefore this definition of ESAK, recall of details, information or content within the museum (semantic information) are necessarily internal to the event of the museum visit.

Context/Time: This included a) abstract, thematic knowledge that contextualised other information in terms of the rememberer's personal history (Conway, Rubin, Spinnler & Wagenaar., 1992). This category also included information from participants that was too broad in scope to count as a specific detail, for example: 'there was a lot of stuff to do with the world war', or comments from participants that qualified the visit in some way: 'there was plenty to see and do'. It also included b) time details that placed the museum visit in the participant's sense of autobiographical chronology as well as details on perceived duration (see Levine et al., 2002).

Place: details of the physical environment of the museum, such as references to the different floors of the museum, the shop or café, or physical features such as 'a grand hall', and mention of the location (city, region) (see Levine et al., 2002).

Person/Social Interaction: Given the potential importance of the social aspect of the museum/cultural visit, this category was created to include a) detail to do with a person or people known to the rememberer at subsequent recall e.g. friend or family member, teacher, or tour guide, and b) social interactions with others, known and unknown.

Event: In line with other autobiographical memory coding systems (Levine et al., 2002), this category includes happenings. It also includes references to people present who were not known to the rememberer, or mentions of crowding in the museum. Emotional reactions or physical actions of others were coded as 'event'.

Sensory-Perceptual (SP) Categories: these categories were used to capture detail in memories that presented as imagery from across modalities: such as visual, auditory, olfactory, spatial, or taste, in accordance with the experience-near episodic elements (see also Levine et al., 2002) described in the autobiographical memory literature (Conway, 2009; Conway & Pleydell-Pearce, 2000; Conway et al., 1992). Two further perceptual categories

were defined: 'pain' (including discomfort and fatigue) and 'kinaesthetic' (including movement).

Emotion: any mention of emotions experienced were coded in this category, whether reported directly as a feeling or state: 'I was very emotional', or whether reported indirectly: 'wonderful exhibition'.

Cognition: details classed as thoughts or implications were coded in this category. This included thoughts relating directly to the exhibit or its subject matter, thoughts relating to the overall experience, thoughts generated in response to the event (visit), and thoughts relating to the rememberer themselves and their autobiographical memories. Cognition also included expressions of interest. Cognitions were not coded for the content within them, to avoid double coding the texts.

Personal reactions: although emotions and cognitions were coded separately to enable a full exploration of the relative impact of each type of reaction to the museum experience, in order to examine the overall importance of individuals' response to the experience, a category of 'personal reactions' was created by simply adding the content from emotion and cognition (see Levine et al., 2002).

A total details score was calculated for each participant and the word count of their memories noted, in order to provide a measure of richness of the memories.

Results

1. Life-Span Distribution

A total of 210 memories were provided by 40 participants aged 40 and over. General memories were excluded, leaving a sample of 128 specific memories from 38 participants. These memories were sorted into 10-year bins, and the age at encoding was plotted against

the numbers of memories observed and the number of memories that would be expected. The expected value was determined by evenly distributing the number of memories provided by the participant across their life span, for example a 40-year-old who provided two memories would have an expected value of 0.5 in the first four time bins (Loveday, Woy, & Conway, submitted.) (see Figure 1):

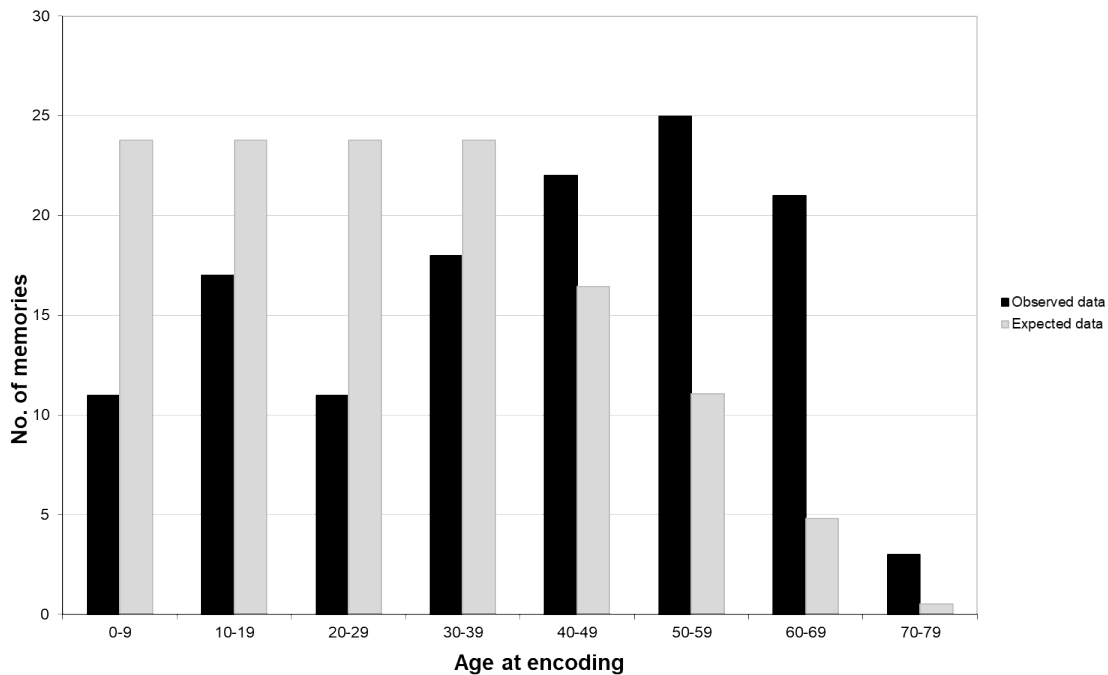


Figure 1: Distribution of specific memories across the life span; expected and observed data

A chi-square analysis confirmed that the patterns of expected and observed data were significantly different [$\chi^2=103.00$, $df=7$, $n=38$ $p<.001$]. Figure 1 suggests that, although relatively more memories were encoded in one of the reminiscence bump decades of 10-19, fewer memories in the first four decades of life were encoded than may be expected. In contrast, more memories were encoded than expected from the 40-49 decade and upwards, indicating a strong recency effect for the sample (where the mean age was 56.84 years).

Data were collected to examine the life period in which people visited museums most frequently. As demonstrated by figure 2, the strong recency effect observed above appears to

reflect the periods in people’s lives when they were visiting museums the most. There is a second peak in the decade 30-39.



Figure 2: Periods in participants’ lives when they visited museums the most, by percentage of responses

2. Visitor Differences

2.1 Reminiscence Bump

The life-span distribution data was split by frequent and infrequent visitor groups. This resulted in a total sample of 18 memories for frequent visitors and 33 for infrequent visitors. Only memories encoded before age 40 were examined, as this represented the period within which all participants could generate memories. This is standardly the period considered to represent the reminiscence bump. All memories within five years of the participants’ ages were excluded.

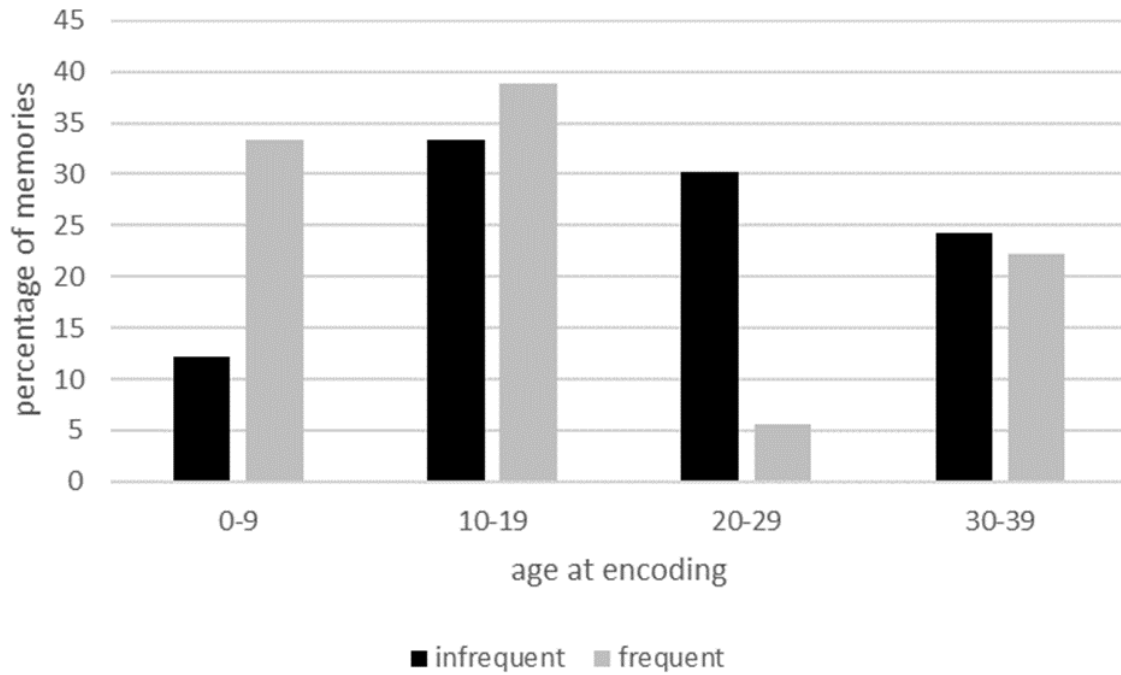


Figure 3: Percentage of memories up to age 40 by age at encoding, split by visit frequency, with five-year recency removed

The pattern of encoding in Figure 3 suggests an earlier peak for frequent compared to infrequent visitors. This is despite the fact that the median ages of encoding for the first museum memories was comparable in both groups. The median age of encoding for the first museum memory was 8 years (range =24) for frequent visitors and 8.75 years (range =45) for infrequent visitors. A Mann-Whitney U test confirmed no difference between these two groups: ($U=574.00$, $N_1=36$, $N_2=36$, $p=.406$).

2.2 Memory Specificity

Memory specificity, special memories and the content of memories was analysed to establish the effects of age and visit frequency.

		Number of Memories
Young	infrequent visitors	4.65 (1.27)
	frequent visitors	5.35 (1.10)
Senior	infrequent visitors	5.55 (0.89)
	frequent visitors	5.45 (1.00)

Table 2: Mean (SD) number of memories provided, by age and visit frequency group

The mean number of overall memories for both frequent and infrequent older adults, and the frequent younger visitors was close to ceiling of six memories (see Table 2). The younger, infrequent visitors appeared to have fewer memories, on average, than the other three groups but a Mann-Whitney U test confirmed no difference in the number of memories between young infrequent and frequent museum visitors: ($U=139.00$, $N_1 = 20$, $N_2 = 20$, $p = .076$).

From the 420 memories generated by participants, three were non-memories. These were excluded from the data and not considered further. The percentage of each participant's memories that were specific and general were calculated and these values used to calculate means for each participant group (see Figure 4).

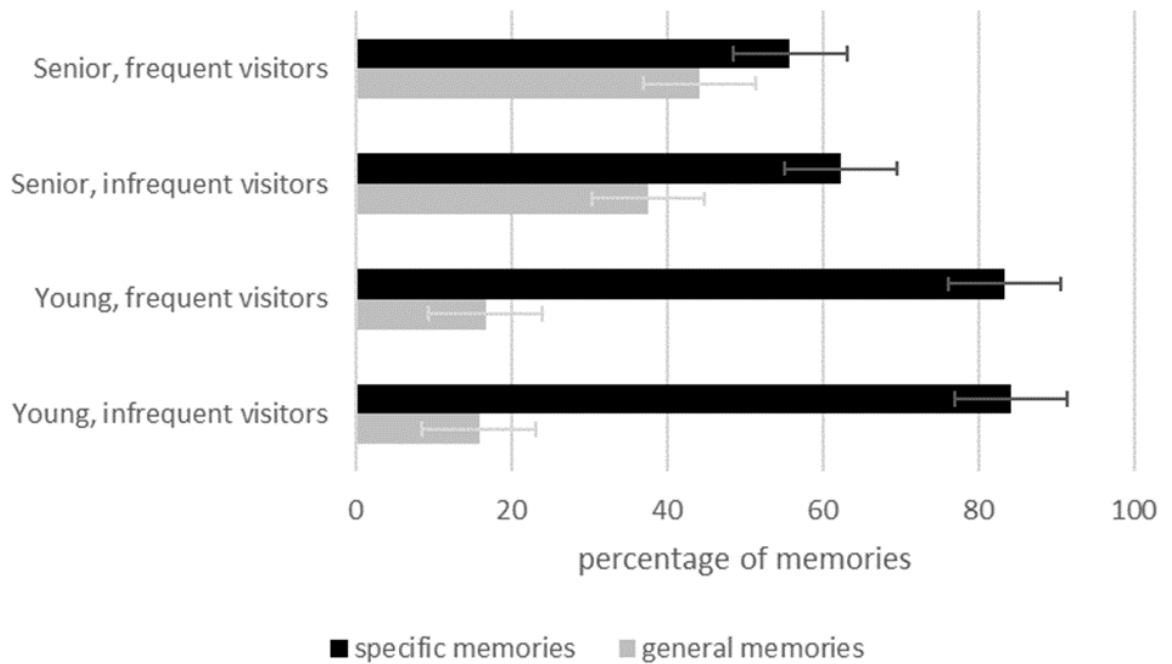


Figure 4: mean (SE) percentages of specific and general memories by age and visit frequency

Figure 4 shows that general memories appear more prevalent in the older participant groups. As the normality of the data distribution did not permit use of ANOVA, a Mann-Whitney U test was performed on the proportion of participants' memories that were specific: ($U = 421.00, N_1 = 40, N_2 = 40, p < 0.001$). This showed that the proportion of specific memories was significantly higher for younger participants (median=1, range=1) than older participants (median =.67, range=1). However, there was no significant difference between frequent and infrequent visitors ($U = 766.50, N_1 = 40, N_2 = 40, p = .74$).

2.3 Special Memories

Transitional, self-defining and 'first-time' museum memories were rare, and there were no 'culture-defining' memories within the sample. All these memories were combined into one 'special memories' category. Although the mean percentage of special memories was slightly higher for senior infrequent visitors (mean= 8.75%, SD= 16.99) compared to all other groups (all means $\leq 4.58\%$, s.d. ≤ 9.92), the numbers were extremely low, and too low for further analysis.

3. Memory Details

3.1 Content:

A total of 417 memories provided by the 80 participants were coded for content, and percentages recorded for content types for each participant. Percentages of the total number of details were then calculated for participant for each detail type and are shown in Figure 5.

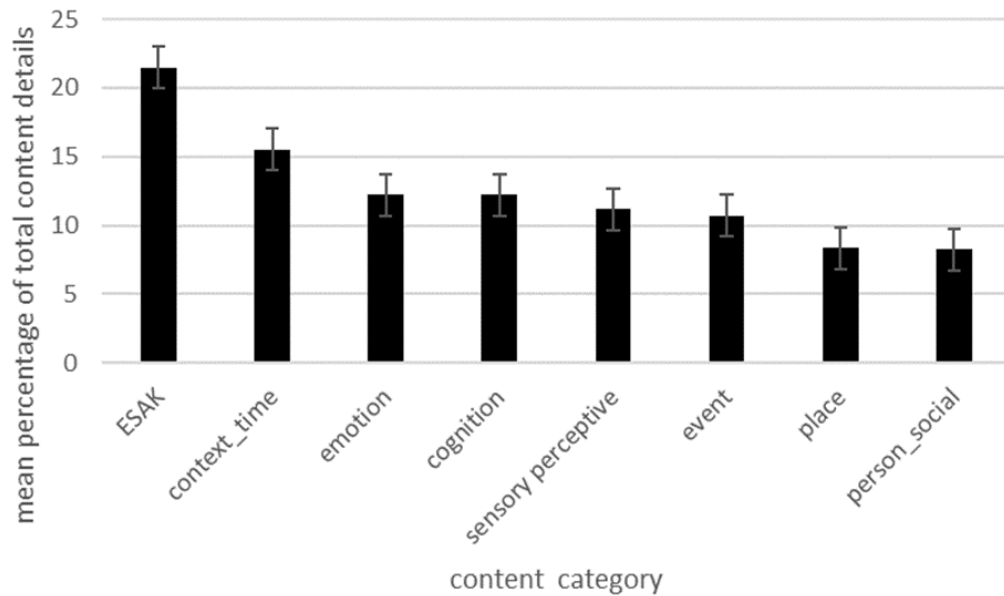


Figure 5: Mean (SE) percentage values for content categories

The data distributions of the finalised 8 content categories was rendered suitable for parametric analysis by means of a square root transformation. Where sphericity could not be assumed, the Greenhouse-Geisser correction was applied. A mixed ANOVA (2 x 2 x 8) was performed on the mean percentages of content types. The between subject factors were age (young/senior) and visit frequency (frequent/infrequent). The within subjects variable was content type (ESAK/context-time/emotion/cognition/ sensory-perceptive/event/place/person-social). There was no significant main effect of age ($F(1, 76)=0.58, p=.45$) or visit frequency ($F(1, 76)=0.54, p=.47$). There was a significant main effect of content categories: ($F(5.6, 427.12)=13.23, p<.001$). There was also a significant interaction between age and content types: ($F(5.6, 427.12)=3.12, p=.006$). There were no other significant interactions (all $p>.1$).

From Figure 5, event-specific acquired knowledge (ESAK) appears to be the most prevalent type of content, followed by context-time. Repeated measures contrasts examining the main effect of content category indicated that there was a significant difference between ESAK and Context-time ($p=.006$); between Context-time and Emotion ($p=.033$), but no difference between Emotion and Cognition; Cognition and Sensory-perceptive; Sensory-perceptive and Event (all $p>.66$). More Event content was recalled than Place content ($p=.033$), but there was no difference between Place and Person/Social Interaction content ($p=.62$).

It is worth noting that when emotion and cognition were combined into reactions, the mean (SD) value for this category was 24.46 (14.67). A t test confirmed no difference between ESAK and reactions: ($t(79) = .63, p=.528$).

In order to explore the interaction between age and category type, t -tests on the 8 detail types were performed, with age as a grouping variable. Bonferroni-holm corrections were applied for multiple tests. There was a significant difference between age groups for emotion: ($t(73.64) = 2.04, p=.042$), with senior participants recording a higher mean percentage for emotion (mean =13.86, SD=8.96) compared to younger participants (mean=10.63, SD=8.19). For event, there was a significant difference between groups: ($t(78)=4.12, p=.002$), with younger participants recording a higher mean percentage for event (mean=13.80, SD=8.74) than senior participants (mean =7.62, SD=6.62). No other t -tests were significant, all $p \geq .22$.

3.2 Memory Richness

		Word count per memory (mean, SD)
Young	infrequent visitors	66.85 (35.41)
	frequent visitors	80.87 (53.74)
Senior	infrequent visitors	63.02 (32.72)
	frequent visitors	63.76 (36.22)

Table 3: The mean (SD) word count per memory for young and senior frequent and infrequent museum visitors.

A 2 (young/senior) x 2 (frequent/infrequent) between subjects ANOVA looking at participant's mean memory word count confirmed that there were no significant main effects of age ($F(1,76) = 1.34, p=.25$) or visit frequency ($F(1,76) = 0.67, p=.42$) and no interaction ($F(1,76) = 0.54, p=.46$).

In order to compare the richness of memories for each participant the total number of details was divided by the number of memories to get the mean number of details. The resulting data rendered suitable for parametric analysis by means of a square root transformation. An ANOVA was performed on the mean details provided. There was no main effect of age (young, senior) on the mean details provided: ($F(1,76) = 0.002, p=.97$), and no a main effect of visit frequency (frequent, infrequent) on the mean details provided ($F(1,76) = 0.160, p=.69$). There was no significant interaction ($F(1,76) = 0.46, p=.50$).

Discussion

This study explored autobiographical memories for cultural events, specifically, museum visits. We sought to establish what the impact of visit frequency might be on the life-span distribution of these memories, and what the impact of visit frequency and age might be on their specificity, 'special' nature and content. The first research question addressed the life span distribution for specific memories of museum visits. For the sample as a whole, the distribution of memories differed significantly from the expected distribution, and can be examined in conjunction with the lifetime periods when participants visited museums the most. The whole group sample does suggest a small reminiscence bump in the teenage years, even though only a low percentage of visitors selected the time period 10-19 as the period where they visited museums the most. However, what is most striking about this data is the strength of recency effect. This pattern differs from other explorations of the distribution of lifespan memories (Conway & Pleydell-Pearce, 2000, Munawar, Kuhn & Haque, 2018). The current study suggests that autobiographical recall of museum visits is biased towards recent experiences rather than their earlier identity-forming years. In other words, memories of museum visiting do not tend to be 'stand-out' memories that are hugely important in terms of identity development during the reminiscence bump period. We suggest that the observed recency effect may reflect the importance of social sharing. Museum-going is an activity or interest, often carried out in a social group, which may provide content for social interaction and interpersonal communication (Alea & Bluck, 2003, Cohen & Conway, 2007). As such, it is part of social sharing, which has also been closely linked to identity (Pasupathi, 2001). This finding is also important from the museum perspective, because it suggests that museum visits not only provide opportunity for social sharing and interaction during the visit (Falk, 2016), but also the memory of that visit forms part of interpersonal communication which may have links to identity. This type of sharing of experiences or interests with others may be

what keep recent memories accessible (Conway & Pleydell-Pearce, 2000). Furthermore, if one is a keen museum-goer, and this forms part of one's current identity, then episodic memories of museum visits may be privileged by the memory system. This would be in accordance with the theoretical understanding of the relationship between the current self and working goals (Conway & Pleydell-Pearce, 2000, Conway, Singer & Tagini, 2004). It is therefore possible that the recency effect observed here is indicative of museums continuing to feed into visitors' sense of identity throughout life, which would support the importance of the relationship between museums and identity as explored in the museum literature (eg. Falk, 2016). An additional explanation for the recency effect is that people are more likely to go to museums when older, and so have more recent accessible memories in these later decades. For example, research has indicated that 41% of all visitors are over the age of 55 (The Audience Agency, 2018). In our sample, where the mean age was 56 years, participants self-reported as visiting museums most frequently in the 50-60 decade, suggesting that recent visits were indeed feeding into the recency effect observed.

The second research question addressed the question of the impact of visit frequency and age on autobiographical memory for museum visits. An exploration of the distribution of memories across the lifespan suggested that frequent visitors had a higher proportion of memories in early childhood, despite the fact that there was no difference between frequent and infrequent visitors in terms of the age of the first museum memory. Whilst it is not clear if the frequent visitors had more visits during early years, if the visits were simply more memorable, or whether it is a combination of both; it is worth noting that this finding is consistent with research that shows an earlier reminiscence bump for music in musicians compared with non-musicians (Loveday, 2016). It is also worth noting that while there appears to be a reminiscence bump, the overall frequency of observed memories was lower than the expected distribution of memories within that period. Nevertheless, these findings

are in line with observations from the museum literature, which have identified the importance of museum visiting in childhood as a grounding for future museum visiting habits in later life (Falk, 2016). Our results are also in line with previous research that has demonstrated that older individuals produced more general memories than younger people (Dikmen et al, 2014, Levine et al., 2002, Piolino, Desgranges, & Eustache, 2009). No differences were found between memory specificity between frequent and infrequent visitors.

The third research question concerned the content of autobiographical memories for museum visits, with a consideration of the possible impact of age or visit frequency. Our coding model was designed to distinguish between different types of content within both general and specific autobiographical memories. The pattern of content of museum memories was similar across all participants, with only minor differences relating to age or museum visiting habits. The results for content showed a hierarchy of content categories in the memories across the sample. These content categories can be understood as the ‘building blocks’ that contribute to the reconstruction of a memory of a cultural experience, and to the re-telling of that memory. When participants’ emotional and cognitive reactions to the museum visit were combined into ‘personal reactions’ (see Levine et al., 2002), the most prevalent categories were that and event-specific-acquired knowledge –*what* was seen and learnt in the museum environment (Wagenaar, 1984). From a museum’s perspective, the prevalence of event-specific-acquired knowledge is an important finding, as this indicates that learning is taking place within everyday memory; in other words, learning about the content and context of the museum. It is also worth noting that the coding protocol coded conservatively for this category. Imprecise details such as ‘there was lots of stuff about the world war’ were deemed too vague for inclusion in ESAK and so were coded as context. Had these been included in ESAK, then the difference between the ESAK and the context-time categories would have been even greater.

The next largest category was context-time. Much of this information encompassed participants' 'back story' to the event they were describing. The prevalence of this category is consistent with the understanding of autobiographical memory's importance in social functions, including social sharing and telling one's own story (Cohen & Conway, 2007). Thus, participants 'told the story' of their memories of museum visits, as demonstrated across the sample: 'I'm from Hastings and we have several museums as we are a historic town' (young, frequent visitor); 'This was the first museum I visited when I came to London' (young, infrequent visitor). The importance of context or 'back-story' also suggests that a memory of a museum visit is integrated with hierarchies of information that are personal to the rememberer, such as 'when I went on school trips', or 'when I was in a relationship with x.' Furthermore, it seems likely that memories of events (i.e. visits and events within them) are also contextualised by conceptual knowledge, such as 'I remember this day really well because as a child I was really interested in astronomy.' This category is therefore consistent with the contextualised and thematic nature of autobiographical memories (Conway & Pleydell-Pearce, 2000). Our findings show that the detail of what was seen or learnt, personal reactions, followed by the context of the museum visit, were the most important categories in these memories. This indicates both that some form of 'learning' took place in the museum, that cognitive and emotional reactions took place, and that visitors contextualised their memory of the visit within their autobiographical knowledge about themselves. The tendency to contextualise is also indicative of the social sharing function of autobiographical memory, as it forms a key explanatory part of narrative.

That emotion should be salient is unsurprising, given that emotion is frequently expressed in the retelling of events (Alea, Bluck, & Semegon, 2004). Events that trigger emotional responses are more likely to be encoded in memory more deeply (Holland & Kensinger, 2010) and both positive and negative emotion have been shown to strengthen

autobiographical memory retrieval in the museum literature (Anderson & Shimizu, 2007, Falk, 2016). Furthermore, emotional memories have been shown to be richer in detail (Jacques & Levine, 2007). Thought-provoking museum visits are likely to involve encounters with unusual or unfamiliar content, or with content that forms some kind of connection to the visitor's personal experience. It therefore seems likely that such encounters may stand to be discussed (rehearsed) more often, thus rendering these cognitive details more accessible later when the event of the visit is reconstructed. Higher levels of both emotional and cognitive content arguably infer that a deeper level of processing has taken place. The salience of emotional and cognitive reflections is consistent with the discussion of meaning-making in the museum literature which describes how visitors reconstruct memories of their visit from the array of thoughts, emotions and visiting contexts (Falk, 2016).

The next levels of the hierarchy all had a relatively small level of content. Sensory perceptive detail and event were followed by place and social interaction. Museum researchers contend that social interactions are a strong influence in the visitor experience (Ellenbogen, Luke & Dierking, 2007, Falk & Dierking, 2000, Falk, 2016). Therefore, it seems surprising that content about people and social interactions should be at the lowest end of the hierarchy. Following Levine et al (2002), we analysed social interaction with known individuals separately from observations or interactions with people not known to the participant (classed within event). It is possible that combining all references to other people into a broader 'people' category may have resulted in a larger overall category. Further research on the nature of memories for experiences, particularly cultural experiences, is needed to contextualise this finding, and provide a benchmark for the importance of social interactions in memories for experiences.

Just as the detail categories were broadly consistent across participant groups, so too was the level of richness of the memories, in other words, the total number of details recalled.

Although older people had more general memories than younger people, the prevalence of general memories did not impact on memory richness. Inclusion of details that are not necessarily linked to a sense of re-experiencing through memory specificity may account for this.

There were some differences as a result of age and visit frequency. Analysis confirmed a higher proportion of emotional content in older participants, and higher proportion of event content in younger participants. It is possible that the higher proportion of emotional content recalled by older adults could be due to the relationship between emotion and autobiographical remembering, that is, that museum visits that evoked more emotion were more likely to endure across the life span (Holland & Kensinger, 2010). However, increased emotional content could also be due to changing relationships with emotion in aging. Research has suggested that older adults process and retain emotional material more deeply than younger adults (Carstensen & Turk-Charles, 1994), and that older adults recall more thoughts and feelings than younger adults (Luchetti & Sutin, 2017, Hashtroudi, Johnson, & Chrosniak, 1990). In contrast, details of event content were more prevalent in younger visitors. These details made up the experience of the day, such as participation in activities, playing games and interacting with displays, making purchases in the shop, taking photos, or recalling details about other visitors in the environment. Such content, when present, enriches memory specificity. It is likely that the event content in our results was an aspect of specificity which contributed to the higher proportion of memories being coded as specific in the younger participants. This finding is consistent with the research literature that has demonstrated higher levels of specificity in younger adults and more general memories in older adults (Dikmen et al, 2014, Levine et al., 2002, Piolino, Desgranges, & Eustache, 2009). Therefore, the findings for emotion and event in this research are consistent with what is known about autobiographical memory and ageing. This suggests that the pattern of

content of memories was predominately similar for all visitors, regardless of age and visit frequency.

Conclusions

This research developed a coding protocol for autobiographical memories of museum visits, thereby developing both our understanding of memories for cultural events, and simultaneously providing insights for museums about the impact they have on their visitors. The exploration of the distribution of memories for museum visits across the lifespan highlighted the importance of recency in the lifespan distribution of museum memories. This finding is suggestive of the importance of museum visits to the social sharing function of autobiographical memory. If one partakes in cultural activities in the form of leisure activities, interests and hobbies, then it seems likely that the memories of these activities will form part of the current sense of self and one's social conversations, thereby promoting the accessibility of these memories through coherence and rehearsal. It is also likely that early positive experience in museums impacts on visit frequency later in life, reinforcing the importance of time invested in programming with children and young people.

The results also demonstrated that all visitors presented similar patterns of recall in terms of content, with the exception of variations in specificity and in emotion content which are consistent with the literature on autobiographical memory and ageing. This suggests that the content of museums memories as it endures over time is less subject to individual differences in the museum visiting experience, but is rather structured by the hierarchical nature of autobiographical memory and the effects of ageing. This finding adds weight to observations in the museum literature that museum memories share structural commonalities and that all memories are constructed from a small number of basic elements (Falk, 2016). For museums, this suggests that visitor demographics may not be the key metric in understanding impact, as all visitors present similar patterns of content in recollections.

Rather, museums could more usefully consider the types of content recalled, and what this may mean for the impact that they have and the way that they engage. The importance of developing an understanding of this memory content through a theoretically driven coding protocol such as this one, is that it allows museums to move beyond the analysis of individual experiences, and allows for the generalisation from samples to wider populations. As such, it opens up possibilities for expanding the unit of analysis beyond individuals (Anderson et al., 2007) and can offer confidence in the possibility of generalisation about impact. Key features of autobiographical remembering were demonstrated in this research; the presence of knowledge acquired during the event, contextualising details that suggest the integration of such information with higher order conceptual frameworks, affect, and more limited episodic information such as experience-near sensory perceptive elements. This research also demonstrates that museum memories are embedded with thoughts and emotions that endure strongly enough over time to present in a remote recall task that was not heavily prompted or directed. For museums, this suggests that finding ways to help visitors relate 'learning' to their own experiences and sense of self stands to create enduring memories. Understanding how a visit might become part of a visitor's personal narrative in years to come is crucial, and programming and interpretation that invites the visitor to embed the visit into their own personal narrative may help to develop the potential for long-lasting memories. Visitors' memories show that they integrate the visit into their own personal history, their sense of who they are, and that their reactions (thoughts, emotions) to the visit are what endure. The application of understanding from autobiographical memory theory will only serve to enrich our understanding of memories for cultural events and their function in human memory.

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