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A qualitative exploration of memory cuing by personal items in the home

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Abstract

We are surrounded by personal items that can trigger memories, such as photos, souvenirs and heirlooms. Also during holidays, we collect items to remind us of the events, but not all bring back memories to the same extent. Therefore, we explored peoples' responses to personal items related to a holiday, using the home tour interviewing method. In total, 63 accounts of cuing responses from nine home tours were analysed using thematic analysis. This resulted in four types of cuing responses: (a) 'no-memory' responses, (b) 'know' responses, (c) 'memory evoked think or feel' responses and (d) 'remember' responses. For each of these cuing response categories, we looked into the types of items and their characteristics. Furthermore, we found that some items can evoke multiple memories. The majority of the memories' content refers to events close to the moment of acquiring the item.

Retrospective remembering can take place in the context of someone's personal environment and is often cued by things, people, locations and situations. Often our personal space contains objects that we cherish or that remind us of our personal past. The presence of memorabilia has been found to correlate positively with mood (Sherman, 1991).

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Research on external memory cues in people's personal environment, such as objects, people and events, and their effects on human memory in psychology research is scarce (Van den Hoven, 2014; Van den Hoven and Eggen, 2014). The majority of memory research is performed using word-cues and sometimes with other modalities like visual, auditory and olfactory stimuli, generally in controlled settings, aiming to unravel the processes that take place in the memory system (for an overview of cuing methodologies, see Miles, 2013). Memory research underexposes the impact the external world has on remembering (Hertel, 1993), for example, the effects of external memory cues.

This article attempts to contribute to fill this gap and presents an exploration of cuing evoked by holiday items. We aimed to study remembering close to real-world situations, in line with an ecological approach to memory (Neisser, 1985). This study has been carried out in the context of a research programme that aims to improve the remembering experience using design to facilitate remembering. The field of human–computer interaction (HCI) and interaction design has exposed an interest in designs that provide external memory cues for remembering in the last few decades (Van den Hoven, 2014). Therefore, a better understanding of cuing in everyday life is desirable to enable us to facilitate remembering by the creation of novel designs.

The main disciplines that study external memory cues are (cognitive) psychology, HCI and cultural studies. In what follows, we will discuss how memory cues have been approached from each of these perspectives and conclude with our own research perspective.

In psychology, a (memory) cue is something that can activate the search process in the mind to retrieve a memory. The source of the cue can be in the mind, such as a thought or an idea, but also something in the external world such as a conversation, a personal thing or a place. This distinction between the internal and external sources is also referred to as internal and external cued remembering (Van den Hoven, 2014). In the majority of memory studies, a cue is used to prompt memories in memory tasks, often with the use of word-cues, but cues can also be presented in other modalities (such as smell, audio or images). The focus of these studies is on studying remembering, and the (external) cue is a tool to activate remembering in an experimental setting.

When the focus lies on personal cues and how they aid remembering, research has often been carried out in less experimental settings, with external cues referred to by different terms. In his theory of learning and memory, Schank (1999) calls them reminders, for example, physical objects, events, new experiences or abstract ideas (internal). Others call them memory aids: props and techniques to assist prospective as well as retrospective remembering, for people in everyday life or aids specifically for the elderly (Caprani et al., 2006; Intons-Peterson and Fournier, 1986). Van den Hoven and Eggen (2014) refer to the term 'external memory cues' as cues with a physical embodiment, such as people, locations and things, which affect the internal memory construction.

In the HCI field, a cue is always external and has a physical, digital, or hybrid embodiment (hybrid meaning physical with digital components). The primary interest lies in how digital items differ from physical items and what can be done to overcome the barriers that digital items and technology impose. The focus is not always on remembering but also on cherished items or personal items such as furniture or art, of which memories can be one of the reasons the item is valued. The names under which they are referred to are, for example, memory triggers (Cosley et al., 2012) or when it concerns personal objects in the home: mementoes (Kalnikaitė and Whittaker, 2011; Petrelli et al., 2008; Petrelli and Whittaker, 2010).

In the field of cultural studies, the focus is on cultural or collective memory. External memory cuing is often investigated through artefacts, photos, memorials and places aiming to investigate how significant historical events have been experienced and are remembered. For example, by examining the public's experience at memorials (Dekel, 2009) or by following expellees/refugees who revisit places where they previously lived (Marschall, 2016).

For the study reported in this article, we were interested in the grey area between items that evoke memories and items that do not evoke memories, whether digital or physical, cherished or not cherished, acquired for remembering or not. To indicate these possessions, without constraints on their form or meaning, we will refer to them with the term 'items' in this article.

This article looks in particular at the self-reported responses when participants look at (or interact with) the item. To make explicit that we are talking about externally *cued* mental representations, we will refer to them in this article as 'cuing responses'. With cuing responses, we mean the self-reported responses evoked by the personal item.

Personal items and the retrieval of memories

In the next sections, we will introduce the literature related to this research. We will start with discussing the topic of digital and physical items in the home and their role as memory inducer. In the second section, we will go deeper into the mental processes of cuing, namely, the concepts of autobiographical, semantic and episodic memory and memory retrieval.

Items in the home: personal memory cues

In our home environment, we surround ourselves with things that we keep for a range of different reasons. For example, photos of our loved ones on the cabinet, text messages on our phone, souvenirs from our travels and carefully chosen furniture that we cherish. Things in the home often reflect the personal self and personal relationships (Csikszentmihalyi and Rochberg-Halton, 1981; Golsteijn et al., 2012; Kroger and Adair, 2008; Petrelli et al., 2008; Petrelli and Whittaker, 2010).

Only a part of the cherished items in our personal environment is valued for playing a role as memory inducer. In fact, most of these items are not and are primarily valued for other reasons, such as their utilitarian qualities or the personal values they represent (Csikszentmihalyi and Rochberg-Halton, 1981; Sherman, 1991). The difference between a memory inducer and a general object is often blurred, as memory inducers can be everyday objects (Csikszentmihalyi and Rochberg-Halton, 1981; Habermas and Paha, 2002; Petrelli et al., 2008; Van den Hoven and Eggen, 2005), and the role of an item can switch between a utilitarian role and a memory inducer.

Cherished objects in a digital form are notably different. Previous research has demonstrated that digital items are less valued than their physical counterparts (Golsteijn et al., 2012; Petrelli et al., 2008; Petrelli and Whittaker, 2010). Moreover, the functions of digital versus physical mementoes seem to be different; where physical objects often have a symbolic meaning, such as personal identity or relationships, digital objects such as photos are often literal representations of past events or people (Petrelli and Whittaker, 2010). Nevertheless, research on remembering with Facebook posts indicated that events posted online were better retained in memory (Wang et al., 2016) and have the potential to support reminiscing (Thomas and Briggs, 2016).

Autobiographical memory: retrieval and construction

Autobiographical memories are the memories of personal experiences in our own lives (Williams et al., 2008). Autobiographical memories play essential roles in our daily lives, such as social bonding, shaping our personal identity and directing future behaviour (Bluck et al., 2005).

The prevailing view is that autobiographical memories are mental constructions, of which the process has been described in a model called the self-memory system (Conway and Pleydell-Pearce, 2000). To construct a personal experience from the past, the self-memory system makes use of autobiographical knowledge (such as personal factual knowledge and cultural knowledge)

and episodic memory (memories of personal events), governed by current goals (part of the working self) (Conway, 2005; Conway and Loveday, 2015; Conway and Pleydell-Pearce, 2000). The memory construction process takes place in what is called the remembering–imagining system (RIS), where both remembering the past and imagining the future take place (Conway et al., 2016; Conway and Loveday, 2015).

The concept of episodic memory was initially proposed by Tulving (1972). It consists of three main components: a sense of subjective time (travelling backwards or forwards in mind); autonoetic awareness (awareness of the mental time travel taking place); and a self, which also exists in subjective time (Tulving, 2002). Examples of episodic memories are events like a holiday trip to New York or having been to a concert of your favourite band. When retrieved during the act of remembering, episodic memories are often represented in visual form (Conway, 2009). Tulving contrasted episodic memory from semantic memory. Semantic knowledge is general world knowledge, not defined by a time period and often not personal (Tulving, 1972). Tulving proposed that its primary use is for language, such as the meaning of words. Nowadays, researchers question the explicit distinction between the two memory systems; the line between them may be blurrier than originally put forward. It has been proposed that between the two extremes of semantic and episodic memory lies an intermediate entity, called personal semantic memory (for a review on personal semantic memory, see Renoult et al., 2012). Renoult et al. drew four types of personal semantic memory from the literature: autobiographical facts (e.g. my sister has a cat named Tiger); self-knowledge (e.g. I am an analytical person); repeated events (e.g. on Sundays, we would always visit grandma); and autobiographical significant concepts, which are semantic concepts associated with vivid episodic memories (e.g. school musical + recollection of seeing my neighbour girl's school musical last week). Often these types of memories are categorised under semantic memory, but research with EEG indicates that personal semantic memory activates neural bases of both episodic and semantic memories, and thus, from a neurological perspective, can be differentiated from the other two (Renoult et al., 2016).

The distinction between semantic and episodic memory is often referred to as 'knowing' versus 'remembering' (Tulving, 1985). It can be difficult to conclude from verbal accounts what type of mental representation participants had in their mind, and this is often resolved by asking participants whether they 'know' it or 'remember' it. If participants say they 'remember' it, participants can bring back to mind the moment it was encoded, and to do so, they have accessed the episodic memory base, and if participants say they 'know' it, it is assumed they have accessed the semantic knowledge base only.

The cue modality, such as pictures versus words, can influence the likelihood of evoking a 'know' or a 'remember' response. A study consisting of five laboratory experiments found that picture-cues led more often to a 'remember' response than did word-cues (Dewhurst and Conway, 1994). Dewhurst and Conway concluded that it depends on which information is activated during retrieval. If the name of the picture is retrieved (as tested in the experiments), and not the sensory (pictorial) information, this leads to a 'know' response. Memory research using different modalities has found different effects on remembering, and it is suggested that these distinct modalities directly affect the search strategy in the retrieval process (Goddard et al., 2005). Moreover, research has shown that contextual factors, such as culture and social interaction, can influence autobiographical memory processes from the start (perception and encoding) till the end (retrieval) (Dudai and Edelson, 2016; Wang, 2016).

The effectiveness of the retrieval cue is believed to depend for a large part on the encoding of the event, which is known as the encoding specificity principle (Tulving and Thomson, 1973). The principle suggests that a cue is most effective if it matches with aspects of the event at encoding, which is at the time the event was experienced. Norman and Bobrow (1979) incorporated the notion of encoding specificity in their model of memory retrieval. In this model, they proposed that

retrieval takes place in a cycle, by forming a retrieval specification, called a 'description' of the entity sought, which is then matched against the available knowledge in memory and evaluated by verification criteria to assess the suitability of the information retrieved. This model was further elaborated by Conway (1996) and Burgess and Shallice (1996) and incorporated in the earlier mentioned self-memory system, a model that explains the constructive nature of autobiographical memory (Conway and Pleydell-Pearce, 2000).

In autobiographical memory research, the retrieval of a specific memory often happens through elaboration of the cue (Conway and Pleydell-Pearce, 2000). One may first retrieve generic memories, such as a 'lifetime period' first (e.g. when I was together with boyfriend x). This may serve as a cue for a 'general event' (those times we would visit his parents), which may cue an 'episodic memory' (that evening we rescued their cat from the roof), after which the retrieved memories are input for the retrieval cycle again. In general, 'lifetime periods' and 'general events' are faster retrieved than episodic memories. In some cases, an 'episodic memory' seems to be retrieved immediately without any steps in between. This is called direct retrieval as opposed to generative retrieval (Conway and Pleydell-Pearce, 2000).

Specificity may not be what the person is aiming to achieve, and a more general response may also be satisfactory (Norman and Bobrow, 1979, and also concluded in Belcher and Kangas, 2013). People with emotional disorders such as depression, however, often have difficulties recalling specific memories, and it seems that the (generative) retrieval process is terminated before an episodic memory is found (Haque et al., 2014).

Home tour interviews and qualitative analysis

In the following sections, we will introduce the set-up and method of our study and discuss the participants and analysis.

Study set-up

In this article, we examine cuing responses based on interviews with nine participants in their homes, focusing on their belongings. This study was an open, qualitative exploration on what makes an item a cue, and cuing responses was one aspect in this study. We asked open-ended questions about the memories, the usage of the item and the cuing response the item evoked. When the home tour was completed, we gave the participants a task in which they had to rank the items on different scales.

This study resulted in a wealth of information, providing much richer information on memory cues and the responses evoked by items than originally expected. It was decided to put the original research questions aside and to start with a thorough examination of a few transcripts using open coding. From there, a couple of new research questions were formulated, based on the available interview data and codes. This led to the decision to examine the cuing responses for all the transcripts in depth and present these results in this article. The main question for this analysis was: What are the properties/characteristics of the (actual) cuing response? We looked at the types of cuing responses, the number of memories attached to the items and the time relation between acquiring the item and the memories.

Method

The interviews were semi-structured and held in peoples' home, using a 'home tour' (similar to Petrelli et al., 2008; Petrelli and Whittaker, 2010; Shenk et al., 2004) and a rank order task (Fabbris,

2012), in which participants ranked items from high to low on different scales. The interviews were audio recorded and transcribed by the interviewer afterwards. For the analysis of this study, we mainly used information from the home tour interviews.

A 'home tour' is a method in which the participant takes the researcher on a tour through one or more rooms in the home where personal items are located. The researcher prompts the participant with open questions about the items and the memories evoked by the items. As holidays are a type of event that often involves bringing home objects and photos, it was chosen as a topic to frame the time span of the memories and type of events and thus the variety of memories. We analysed the data qualitatively. We used NVivo software (QSR International Pty Ltd., 2012) for coding the data, and we made memos during the transcription and analysis phase.

Before the actual series of interviews, we conducted a pilot interview, which led to revisions in the interview questions and ranking scales. One question, about when the item was acquired, was removed because it did not yield valuable information, and one of the scales was replaced because the participant interpreted the scale exactly the same as another one.

Participants

Following approval from the institution's human research ethics committee, we recruited participants via an invitation posted on online media, such as the university's staff mailing list, the research project's website and Facebook. In total, nine participants participated in this study, six women and three men, all of them were living in Sydney, Australia, and were between the ages of 27 and 66 years (average 42 years). The majority of the participants had completed a university degree (eight out of nine), varying from bachelor to PhD. All the participants had their own place to live, an apartment or house, sometimes shared with a partner, child or sibling (six participants).

An explanation on the procedure was given in advance by email, in which the researchers assured the participants that they did not need to prepare anything for the interview. Before the start of the interview, the participants were introduced to the goal of the study and the procedure in more detail, and a consent form was signed.

Interview procedure

At the start of the interview, participants were asked to choose one of their holidays that took place longer than 1 year ago and shorter than 5 years ago and which took 5 days or longer. We chose this time frame to ensure that the holiday had taken place long ago enough that items could help them remember it (and it is not just remembered because it happened recently) and recent enough to increase the chance that they still had six or more items related to this holiday in the home.

After they briefly explained which holiday they chose, each participant was asked to think of items they had in the home that related to this holiday, digital as well as physical. The participants wrote these items down on cards until they had mentioned 10 items or less if they could not think of any more items. On average, eight items were mentioned. In cases where the participant wrote down a term that consisted of more than one of the same type of item, such as all the holiday photos, several clothes or fridge magnets, the participant was asked to select a particular photo, clothing or fridge magnet. They were allowed to select as many as they liked from the same type of items, but they would be interviewed separately for each item. We made an exception when participants had organised photos in albums or a website. In those cases, the photos were considered as a whole and listed as one item.

When the participant had listed all the items, the home tour started, and the participant showed the items in their original location. For each item, a couple of questions were asked, if not answered

spontaneously already. For example, what comes to mind if they see the item and if they perceived it as a memory cue. From each item, a photo was taken to support the transcription and analysis of the interviews afterwards. If new items came to mind during the interview that they were very keen to talk about, they could include this item and write it on an empty card.

Data analysis cuing responses

The cuing responses have been analysed using a bottom-up coding process, based on the coding and analysis approach of thematic analysis (Braun and Clarke, 2006, 2012). The inductive nature of this approach makes it suitable for open-ended research questions, like in this explorative study. The selected excerpts for analysis concerned in most cases the participant's answer to the question 'if you look at this item, what comes to mind?'. This question, however, was not always asked; if the participant already told the interviewer about what came to mind, the interviewer would pass over this question. This spontaneously explaining what came to mind occurred in four interviews and would often happen when the participant started to understand the question routine, after at least four items had been discussed. Thus, they anticipated the questions that were likely to follow up. We observed no considerable differences between the spontaneously mentioned cuing responses and other responses. Moreover, excerpts related to the cuing response in other parts of the interview were selected for analysis if relevant. We focused on the first response and coded them singularly. These codes were developed into meaningful themes afterwards. In total, 63 items from nine interviews were included in the analysis, which will be explained in the subsequent paragraphs.

In total, 8 items from the 71 in this study were excluded from the analysis. We disqualified five items because the items were not in the house or the participant could not find them. The participant did not see the item(s) at the moment of the interview, and this entailed that they had to answer the question 'what comes to mind when you see this item' from memory, which possibly affected the reliability of the answer. We excluded two other items because an earlier question was not asked, which would have allowed the participant to tell the story behind the object and event. Therefore, their answer to the question 'what comes to mind' was a combination of an explanation of the event and acquisition of the object. The last item was excluded because what the item evoked was not explicitly expressed by the participant. We continued with 63 responses and items for analysis.

The analysis aimed at interpreting and gaining a deeper understanding of what was happening in the reported cuing responses. The focus in this article will be on presenting the findings solely from a qualitative perspective and exploring what kind of cuing responses we found among participants in connection with their holiday items.

Findings: cuing responses and types of items

In this section, we will present the four main cuing response types that we found, as well as other findings revealed by the analysis. We will first introduce the items the participants selected and of which the corresponding cuing responses have been analysed. Hereafter, we will introduce the main types of cuing responses found from the analysis. We will also relate this to the types of items that correspond with the particular cuing response.

Items in this study

In total, 71 holiday-related items were selected in the home tour interviews, of which 58 were in the physical form and 13 in the digital form. The items can be grouped into eight categories (see Table 1):

Table 1. Overview of items included in this study.

|	Physical	Digital	Total
Wearables	**16 (17)**		**16 (17)**
Clothing and shoes	11		11
Jewellery	3		3
Bags and wallets	2 (3)		2 (3)
Images	**5 (6)**	**10**	**15 (16)**
Single photos or postcards	3	7	10
Organised photo or video collection (album, website or collage)	1 (2)	3	4 (5)
Canvas printed photos	1		1
Decorative objects and souvenirs	**13 (15)**		**13 (15)**
Fridge magnets	5 (6)		5 (6)
Drawings (by children or artists)	3		3
Others	5 (6)		5 (6)
Books, guides and papers	**6 (8)**	**1**	**7 (9)**
Books and guides about destination	4	1	5
Random papers and leaflets	1 (3)		1 (3)
Leisure reading books	1		1
Handwritten and typed notes and journals	**2**	**1**	**3**
Food and drinks	**3**		**3**
Body and shower creams	**2**		**2**
Others	**4 (6)**		**4 (6)**
Total	**51 (59)**	**12**	**63 (71)**

Numbers in parentheses show the numbers including the invalid items.

'wearables'; 'images'; 'decorative objects and souvenirs'; 'books, guides and papers'; 'handwritten or typed notes and journals'; 'food and drinks'; 'body and shower creams'; and 'others'. Most often the items chosen were wearables and images. The latter category consisted of 10 digital photos and collections, and 6 items were printed images, like photos, sometimes as collages or postcards. It is the only category that includes more digital items than physical items. Other common categories were clothes and shoes, decorative objects and souvenirs (many fridge magnets), jewellery, bits and pieces such as random papers and leaflets or food and drinks. No music or audio media were mentioned. Some items had been intentionally acquired to remind owners of memories. Others were acquired before, during or after the holiday, without the intention to remind them of the holiday.

Cuing responses

We differentiate between cuing responses and the remembered event. The latter describes the memories that the participant associated with the item, contextualising the events and accommodating it to the listeners. The explanation of the item's background and memories can be seen as the narrative (Fivush and Merrill, 2016) or storytelling (as defined in the area of domestic photography) rather than reminiscence talk (Frohlich et al., 2002). One describes, for example, what the event was about, their experience and feelings, who was there and what happened before and after. The cuing response describes what comes to mind when the participant perceives the item, for as far as they are able to express this. While this response could match with the remembered past events, it is not always the case.

After a bottom-up analysis that focused solely on cuing responses, four different types were identified: (a) 'no-memory' responses, (b) 'know' responses, (c) 'memory evoked think or feel'
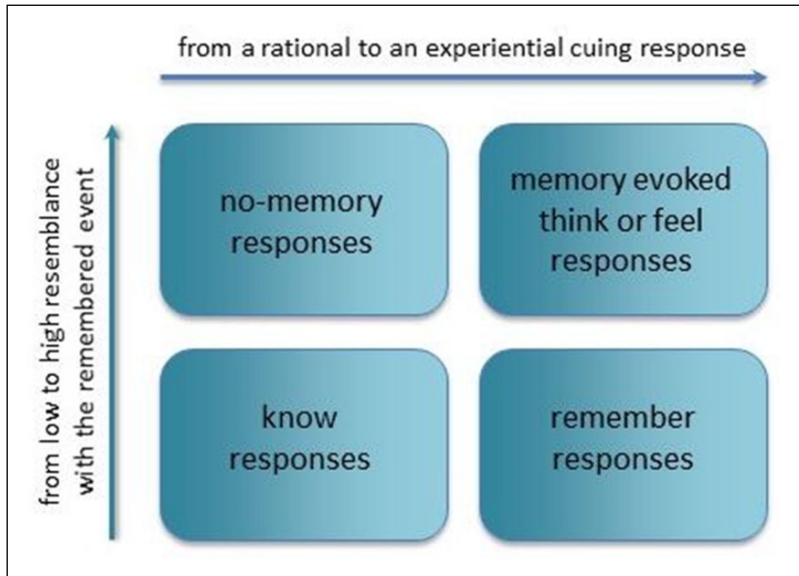
Figure 1. Cuing responses triggered by holiday items.

Table 2. Overlap of cuing responses with categories from existing schemes.

	AMT/SCEPT (Raes et al., 2007; Williams and Broadbent, 1986)	Memory specificity (Conway and Pleydell-Pearce, 2000)	Personal semantic memory (Renoult et al., 2012)
No-memory responses	–	–	–
Know responses	Extended memory	General events	Autobiographical facts
	Categorical memory	Lifetime periods	Repeated events
	Semantic associate		Self-knowledge
Memory evoked think or feel responses	–	–	–
Remember responses	Specific memory	Episodic memory/event-specific knowledge	Episodic memory

AMT: autobiographical memory test; SCEPT: sentence completion for events from the past test.

responses and (d) 'remember' responses (Figure 1). These four types depict the relation of the cuing response with the experience and the resemblance to the remembered events. About half of the cuing responses fell in the group 'remember' responses, with the other half being spread across the other three types.

In Table 2, we compare the types of cuing responses with the autobiographical memory test (AMT; Williams and Broadbent, 1986) and subsequent tests derived from the AMT, such as the sentence completion for events from the past test (SCEPT; Raes et al., 2007); the specificity levels 'lifetime period', 'general event' and 'episodic memory' (event-specific knowledge) (Conway and Pleydell-Pearce, 2000); and the categories of 'personal semantic memory' (Renoult et al., 2012).

Figure 2. A skirt bought on holiday in Japan cuing a 'no-memory' response.

This will be discussed further in the section 'Discussion'. We will go through each of the four types one by one, starting with 'no-memory' responses.

No-memory responses

The cuing responses in the 'no-memory' responses group were either responses not related to personal memories at all, such as practical thoughts related to the item or just hardly cued a 'remember' (or 'know') response. Some participants reported that by thinking hard, they could come up with a memory. What these responses indicate is a difference between a memory *associated* with the item and whether this memory was *activated*. In fact, all the items did have some kind of association with the holiday attached; otherwise, the participant would have never selected them for this study. However, we see in this group that these memories are not, or perhaps very weakly, activated, or other thoughts not related to any memories come to mind instead. The following example shows this dividing line between cuing a memory and not cuing a memory with regard to a well-appreciated skirt she bought on her holiday in Japan (Figure 2):

> The first thing that comes to mind, is what I would wear it with, when I would wear it. [...] [W]hen I tell the story, it makes me think of the memory. But I don't think it is a memory cue. Unless, I'm asked about. (P5)

The participant told the researcher about the experience of fitting and buying the skirt in the Japanese store and also the occasions she wore it during the holiday. As a reason for the memories not being cued, the participant explained that the item was just part of her wardrobe and also worn very often.

What almost all the items in the 'no-memory' responses group had in common was that participants had used the items, such as clothes or food items. Some items were used during the holiday, others after the holiday or both. Possibly the frequent use has weakened the original relation with the memory of the holiday.

Know responses

Participants reported cuing responses that were rather factual in nature. They *knew* that the item represented an event from the past, as in autobiographical knowledge (Conway and Loveday, 2015), but

Figure 3. A holiday photo of a seal as desktop background image cuing a 'know' response.

the cuing response only superficially touches the memory and evokes mainly semantic knowledge regarding the associated events. Sometimes, the holiday is remembered as a whole, the so-called lifetime periods (Conway and Pleydell-Pearce, 2000). Similar to the previous theme 'no-memory' responses, participants reported they would easily be reminded of memories if other people were to ask about it. However, spontaneously, it only touches the memory on a topical level. We see this explained in the following example about a desktop background photo of a seal (Figure 3):

> Yeah, so it does evoke memories, and oh this, and this, you know, you go, when you are in the context of talking to someone about it, when you start going into the depths of the memory. But, when I see that every day, you know, a lot of the times it is just.., keeps you.., oh I took that photo. That's cool. (P6)

She explained that mainly factual knowledge becomes apparent when she sees the item, and the reliving experience remains absent. The episodic memories do not come to mind unless making a conscious effort to recall it (being engaged in remembering), or other people ask about it. The explanation that was given by the participant (and also by some other participants) for the 'know' response is that she sees the item every day.

Most of the items in the 'know' responses group have been perceived a lot after the holiday, and it also contains some typical souvenirs. For example, a photo that has been used as a desktop background image, a watch bought during the holiday, a fridge magnet, a camera (bought for the holiday), a key ring and shopping bags (souvenirs). Seeing the items a lot may have flattened the cuing response, as one of the participants explained,

> [B]ecause I just know it. […] I think when you got something with you all the time, you don't need the memory jogger. Because it is there. And you know that it, where it came from. (P4)

Memory evoked think or feel responses

In this category, participants reported thoughts, feelings, judgements or reflections that appeared in the present and were based on their memory; some examples include pride, happiness or nostalgia.

Figure 4. Canvas photos cuing a 'memory evoked think or feel' response.

Most of the time, the memory remains rather abstract, sometimes even semantic of nature. The difference between other mentioned types ('know' and 'remember' responses) is that for the current type, the cuing response is not about remembering a thought or feeling from the past event but that it is a thought or feeling that occurred afterwards. We cannot be certain from these data whether the thought was evoked immediately when looking at the item or whether the thought was cued by the memory that came to mind. However, they all report a thought or feeling as their first cuing response, and these thoughts or feelings relate to the memories associated with the item.

We often saw nostalgic longing. Not only to the past but also to the future, as a kind of daydreaming based on the memories. A participant said while looking at some canvas photos from the holiday (Figure 4):

> That I want to go again [grin]. […] I guess it reminds you that life is not crap. (P3)

The participant does not mention any specific memories nor any semantic knowledge related to the holiday. The cuing response has been derived from memories but seems to stay at an abstract level.

The strength of the link between the memory and the thought differs widely among the responses within this theme. The next participant reports that his thoughts, evoked by a photo of a sculpture in Barcelona, are kind of separated from the memory:

> '[T]his gives me more strong feelings about… the nature of things than the actual holiday maybe'. […] 'There is something about it, it is really intimate'. […] 'You know, it's a big part of my trip, it is a memory I always have. When I think of my trip I think of this photo'. […] 'Yeah, when I think about it is, it is a part of the trip. But somehow this is can be taken out of the trip'. (P1)

The items in the 'memory evoked think or feel' responses predominantly have visual qualities, for example, photos on canvas, a child's drawing, a hand-drawn poster, a collection of random papers that had partially visual qualities, and two photos, one digital and one framed. Another characteristic of this theme is that a part of these items consist of multiple cues in itself. For example, the earlier mentioned framed photo was part of a photo collage (not all from the holiday), the poster consisted of handmade drawings from multiple events over a couple of weeks and the collection of papers covered several events from the holiday.

Remember responses

'Remember' responses are accounts where the experiences of past events come to mind. Often these accounts come with descriptions of how things looked or felt. In this group, the items bring back episodic memories from the holiday. The memory that comes to mind can be extremely detailed, as in reliving the experience.

We heard verbal accounts that evolved as if the person was going through the experience again, step by step. A participant, who described what came to mind when she saw a bottle of Sake bought at a distillery in Japan, seemed to walk through the museum again until she reached the point of buying the bottle she now had in her cupboard. However, this is not always the case. We have also seen cuing responses in which the participant remembers a very specific moment. This is illustrated by the smell of a body wash, which the participant had bought and used during his travels (Figure 5):

> So, when I smell this, [P1 opens bottle] it reminds me of when I was in Barcelona in a hostel. And I was using this every day, and it reminds me, it takes me back to the shower. Right there. Straight away, in that hostel. And Barcelona and that street I was on […]. (P1)

Some items really helped the participant to construct the memories and fill in missing details. The participant in the next example showed a book about a temple, and after explaining the cuing response, she explains how the book helped her to remember (Figure 6):

> I mean, seeing it reminds me how much I forgot. […] I would have forgotten the detail of the individual deities. […] and I had forgotten how impressed I was by these individual statues. […] And even, it feels like I can remember the smell of it. (P5)

The book not only reminded her of the appearance of the temple but also reminded her of how she felt at that time (impressed), even with the memory of the smell coming back to her (smell of incense).

The group of 'remember' responses contained the majority of the items with a wealthy variation of item types. Almost all the digital photos can be found in this category and also some of the clothes, fridge magnets and city guides, all acquired during the holiday. This suggests that almost any item, whether intended as a souvenir or not, can become a memory cue for a past event.

Multiple memories attached to one item

Initially, it was not taken into account that one item could evoke multiple memories. In this study, participants sometimes spontaneously mentioned up to four different memories, when asked what came to mind. Some memories seemed to be cued by the previous memory, while others seemed to be cued by the item. Some items comprised multiple cues in themselves that cued different memories, for example, a canvas collage showing four images referring to different days and events (see Figure 4).

Figure 5. Body wash cuing a 'remember' response.

Figure 6. Book of Japanese temple cuing a 'remember' response.

What memories become attached to the item?

Almost half of the memories of the type 'remember' responses refer to an event taking place around the time the item was acquired. This outcome can be expected from holiday items, as they are often acquired for remembering an experience they wish to remember. We also found a fair number of memories relating to the specific moment it was acquired. We found accounts of stores, aisles and stalls where the items had been found and bought, sometimes as trivial as choosing a fridge magnet in the souvenir shop. This sometimes included the conversation with the sales person or other customers. Even a participant who showed some sent Facebook messages to her, now ex-boyfriend, reported it reminded her of *creating* the messages, rather than the content it referred to or the person it was sent to:

> Mostly reminds me of writing the messages. I was writing the messages when I was in the hotel room, when I was by myself […]. (P8)

Not all the items were typical souvenirs, and they were not always bought for the purpose of remembering. Items also cued memories from further back in the past that were not holiday related. One of the participants was reminded of an event of his childhood, which was told by his mum. It can also trigger memories of events that happened after the holiday. One participant was reminded of the barbecue where she wore the particular piece of clothing, sometime after the holiday.

The majority of the memories reported in this study related to just before, at the moment or just after the moment of item acquisition, sometimes covering a time span of a few days. Only in a few cases, the memory related to something later in the trip, for example, a significant moment when an item had been used.

Discussion

In the following sections, we will reflect on the home tour interview as a method, the cuing responses and memory retrieval, the item–memory relation and the event times of the memories in relation to the item acquisition.

Reflections on the home tour method

The home tour interview provided an informal way to collect rich descriptions of people's cuing responses in a relatively natural setting. Participants enjoyed the activity and often spoke passionately about their items and holidays. They rarely needed prompts to elicit what was going on in their minds. Besides these positive effects, the interview set-up and the storytelling nature of the method may also have biased the cuing responses. The whole interview was about one holiday, and explaining the item and the story behind it may have impacted the cuing response and primed them to remember events from their holiday. The cuing responses in this study are for that reason not a spontaneous representation of what normally comes to mind if they encounter the items, but they give an indication of the different types of responses that can be evoked by personal items.

The participants chose the items by free choice. These items were not equally distributed among item categories, with the majority of items in the wearables and images category. Therefore, we can only carefully draw conclusions about the spread of items across the types of cuing responses and the results about their correlations need to be interpreted as indicative only.

There was a notable difference between the questions 'can you tell me about this item?', which was usually the first question, and the question 'what comes to mind if you look at this item?',

which was usually the fourth question, and it turned out to be crucial to have these as two separate questions. The first question seemed necessary as a scaffold for the fourth question about 'what comes to mind'. Not addressing the item itself and the story behind it caused a cuing response mingled with item and event information to scaffold the story.

Participants may have interpreted the question 'what comes to mind' in more than one way. They could give the answer for what it cues right at the moment of the interview (while an interviewer stood next to them) or what it normally cues when they see it. If the participant asked, the interviewer would explain she was interested in what it would normally cue. We were interested in cuing in everyday life, with the cuing response as close to a normal encounter with the item as possible.

Responses to items

The variety of responses we found could be ranked gradually from 'no-memory' to 'remember' responses. The 'memory evoked think or feel' responses are the odd one out because rather than having a recollection as the final retrieval result, the item evokes a thought or feeling. The thought or feeling is strongly connected to what is remembered (knowing or remembering) and would not exist without the memory.

As is represented in Table 2 (see under section 'Findings: Cuing responses and types of items'), two types of responses in this study show overlap with existing schemes: 'know' responses and 'remember' responses. In categories such as in the AMT/SCEPT and the levels of memory specificity (Raes et al., 2007; Williams and Broadbent, 1986; Conway and Pleydell-Pearce, 2000), the time period is generally the defining factor for the different types of responses. In the study discussed in this article, we take another perspective; the focus was on the participant's experience, rather than the content or time span of the memory.

Another comparison that can be made is with the four types of 'personal semantic memory' (Renoult et al., 2012), which have been described earlier in this article. All categories can be paired with the cuing response types in this study, except for the category 'autobiographical significant concepts' (a concept plus episodic memory).

The themes 'Memory evoked think or feel' responses and the 'no-memory' responses are not related to any of the categories found in the literature. The latter may, for obvious reasons, not be of much interest for psychological memory research. The reason why the type 'memory evoked think or feel' responses has not appeared in other schemes is unclear but may be due to the different setting in which this study took place. The items are in, and also part of, the home, which may allow for more general thoughts, feelings or reflections popping up. Moreover, the fact that items cued these thoughts and feelings may have played a role. The intrinsic qualities of items may evoke feelings or represent an atmosphere that facilitates thoughts or feelings, more than cuewords do. Some 'memory evoked think or feel' responses bear resemblance with imagination, which is supported by episodic memories, as described in the RIS (Conway et al., 2016; Conway and Loveday, 2015).

Do we see an iterative retrieval process in the responses? An often-proclaimed exclamation in the theme 'know' responses was, 'It just reminds me of …, but if I would really think about it, then … '. We could relate this to the 'effort' that is needed for retrieval. The view of memory retrieval as an iterative process (from general to specific) could be an explanation, in a way that the retrieval of an episodic memory is terminated before a specific memory has been found. In the theme 'remember' responses, there were no mentions of effort. However, we must bear in mind that it is hard for participants to express their mental retrieval process and that this was also not explicitly asked.

The item–memory relation

When looking at the relation between items and cuing responses, a couple of interesting things stood out. Visual details seemed to be important, how often the person encounters the item (seeing it every day was often found with 'know' responses) and the role the item has in their day-to-day life (a functional role linked to 'no-memory' responses). The findings seem to indicate that strong visual items, such as digital photos that are not seen every day, increase the chance of a 'remember' response. The picture superiority effect has been known for a long time, and the common explanation has been that its rich sensory-perceptual representation facilitates semantic access to memory (Dewhurst and Conway, 1994). In the study presented here, where we have especially seen pictures in the form of photos, we could also say that a picture is very explicit in what it represents and that it contains many cues in itself. These cues are indeed sensory-perceptual but may also contain many details of the experience that help to construct a memory.

What the current explorative study indicates is that the items evoking a 'remember' response encompassed all item categories, so in principle, all types of items can be memory cues for episodic memories. However, the findings also indicated that 'no-memory' responses were linked to utilitarian and frequently used items. Items in relation to 'know' responses had been seen regularly, and items in relation to 'memory evoked think or feel' responses were often compositions or collections with visual qualities. Digital photos were often found in relation to 'remember' responses. This may have been caused by selectively picking important photos for this interview, as most people had large amounts of photos from their holidays. The correlations are drawn from an explorative and qualitative study and will need to be confirmed.

In their daily lives, people encounter personal items that can potentially cue memories in all its varieties. A 'remember' response may not necessarily be the desired outcome for people; they could be after a less specific response or a thought or a feeling.

The event times of the memories in relation to the item acquisition

As reported in the findings, the majority of the memories evoked by the items centred around the moment the item was first seen, such as the store or aisle where the item was found or the moment and location when a Facebook message was created. The finding that memories centre around the time that the cue became part of their life was also found in several studies by Rathbone et al. (2008, 2011). Although their cues were of a different nature, they used self-reported 'I am statements' (self-images) as a cue for self-related memories. In their studies, in which multiple memories were collected with an 'I am statement' as the cue, most memories of events were dated close to the year of formation of the particular self-image, which supports the idea that the organisation of autobiographical memory is clustered around the emergence of the self (Conway and Pleydell-Pearce, 2000). Since the memories related to the holiday items seemed to be clustered around the moment of acquiring the item, we speculate that cued memories centre around the origin of the item.

Conclusion

The study presented in this article aimed to investigate the cuing responses triggered by personally owned holiday items. Home tour interviews were held with nine participants, and the cuing responses of 63 items were analysed qualitatively.

We found that items related to a holiday can cue a range of responses, which we grouped into four types: 'no-memory' responses, 'know' responses, 'memory evoked think or feel' responses, and 'remember' responses, with the latter containing the majority of the responses.

The results of this study suggest that almost all types of items can become cues for episodic memories and evoke a 'remember' response. We found images, books, guides and papers, decorative objects or souvenirs, wearables, handwritten/typed notes and journals, body and shower creams, food and drinks and items from the 'others' category. An interesting finding was also that almost all the digital photos evoked a 'remember' response.

Items were found to cue multiple memories. Some participants reported up to four different episodic memories cued by one item. Although the majority of memories referred to events from the holiday, also memories from (far) before the holiday or after the holiday came to mind. Most of the memories participants recalled referred to a moment in time close to their first encounter with the item. They often recalled the shop or place they got the item from or the event just before or after the acquisition. Investigation with other personal items is needed to determine whether this finding is generalisable.

We have to bear in mind that the study has been carried out with a small sample of participants and is limited by particular types of objects (holiday items). The findings as such provide insights in how personal items potentially cue at home. The findings pointed to a variety of cuing responses that often referred to the moment of acquiring the item and in which multiple memories were cued by a single item. More research is required to determine whether the four types of cuing responses cover also responses cued by other types of items in the home.

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