Possessions and Memories

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Abstract
People often acquire souvenirs and photographs to facilitate remembering, but possessions and memories can relate to each other in a variety of ways. This review paper presents four different connection types found between meaningful things in our everyday lives and our personal memories. Each connection type either focuses on possessions *or* memories and the connection between the two is either active *or* lost. These perspectives will be detailed through examples of studies and design cases from different fields and research areas. More studies have been found focusing on existing connections between possessions and memories, such as in human-computer interaction, design, material culture, psychology, and marketing, than those lost, which were specifically focused around ageing, forgetting, heirlooms, identity and hoarding behaviour. Our review of connections between possessions and memories accumulate to suggest the attachment people ascribe to certain possessions is mirrored by the ability of objects to fulfil people's desire to preserve, embody, showcase and recollect certain memories.

Introduction

People often develop an attachment to a possession for its ability to embody and bring to mind personally significant memories. These memories include facts about the time and place the object became a possession (e.g., gifted by a grandmother to her 12-old grandchild) and personally experienced events (e.g., remembering the way your grandmother handed a gift to *you*, with a joyful smile as you tear away the wrapping paper). In this review, we will first define key terms. We will then discuss how possessions and memories are related, detailed through examples of studies and design cases.

The term *possession* has been defined as "personal identification with the item as an extension of the self" and *possessions* as "things we call ours" [1]. Possession relates to ownership of things, or "psychological ownership", which is defined as "the state in which individuals feel as though the target of ownership or a piece of that target is 'theirs'" [2]. Ownership can be interpreted in many ways, in particular in the digital domain where having access and online sharing results in a range of ownership options (explored in detail in [3]).

When we talk about possessions in this paper, we aim to be inclusive, also with regards to these ownership options, such as created digital content and subscription-based services. In terms of materiality these things we call possessions can be pre-owned, newly produced or self-constructed and physical, digital, or hybrid in nature.

The term *memories* in this paper can refer to autobiographical or episodic memory [4,5], which are long-term memories of events that took place in a person's life and relating to themselves. In the context of this paper, especially in product design research, memories can also be seen as loose associations to time periods (*childhood*) or places (*home*). Since personal media that are used by people to support memory are increasingly digital and online [6], this includes photos and videos, documents and social media; technology is becoming crucial for supporting remembering practices (e.g., [7,8]).

Studying possessions and memories is done in different fields as can be seen in the diverse examples later, but the emphasis in this paper is on perspectives including or relating to design and technology, such as in Interaction Design (IxD) and Human-Computer Interaction (HCI). These two multidisciplinary fields study people's behaviour and experiences in relation to enhancing people's lives with interactive technology in various areas, including remembering.

Connections between Possessions & Memories

When looking at the literature across different fields and research areas, we identify four different kinds of connections between possessions and memories (see Figure 1). We use the term connection to represent an ongoing bond between a person's cognition and a representation in the physical world. The four connections might be best explained through a fictitious example around a personal possession:

Imagine visiting your grandparent and playing cards at the table together over many years. The beautifully crafted chair you always sat on was given to you by your grandparent and it is a valued addition to your dining room (*Connection type 1* in Figure 1). Sitting in the chair

reminds you of times spent playing cards with your grandparent and cues personal memories of them (*Connection type 2*).

You might forget some or all of the memories that once were attached to the chair. This forgetting can happen gradually over time or because the chair was used in everyday life and gathered new memories (*Connection type 3*). When the chair is no longer in your possession, the memories it once cued may remain even though the cue itself is no longer present (*Connection type 4*).

These four types of connections can be distinguished through the connection status and perspective. The connection status can be *active*, as in Connection types 1 (C1) and 2 (C2), or can *loosen* or even be *lost*, just like in Connection types 3 (C3) and 4 (C4). The perspective could be focused on the *possessions*, as in C1 and C3, or on the *memories*, like in C2 and C4. Each of these types has been researched by different research fields and areas, which we will elaborate on in the following sections.
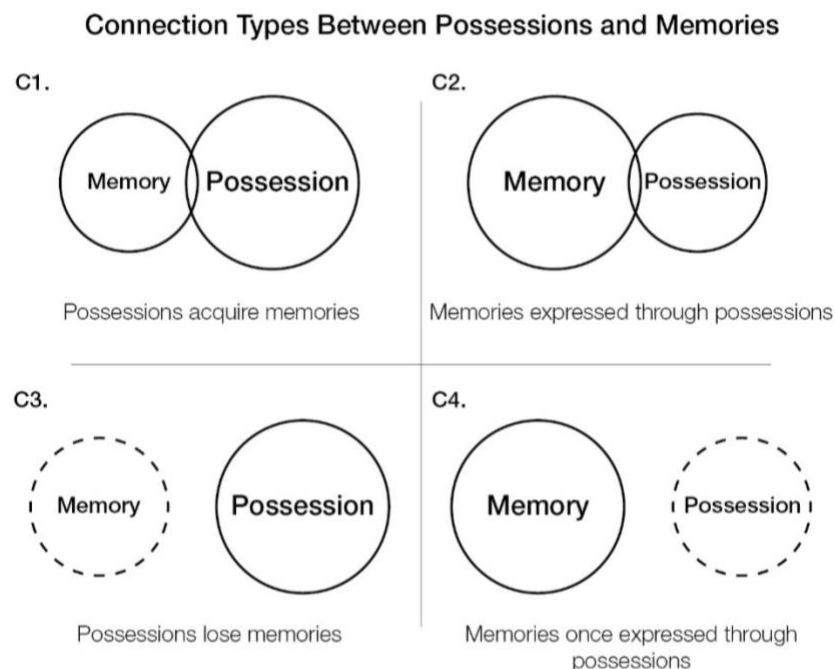

Figure 1. Visual of the four different kinds of relations between possessions and memories, C1 and C2 represent a connection between possession and memory that still exists, from an object or memory perspective respectively. C3 and C4 have lost the connection (temporarily or permanently) between possession and memory, and either the object or the memory remains.

Connection type 1 (C1): Possessions can acquire memories
Through acquisition, usage, ownership or access, possessions form connections to experiences in a person's life that may form part of their autobiographical memory. Connections can be established by the possession's proximity, involvement or likeness to the memory it can bring to mind. These memories are not always episodic memories, but can also be summations of broader time periods (e.g., my childhood) or concepts (e.g., summer) as outlined further in C2.

The phenomena of possessions acting as memory cues has held implications in one form or another across a broad range of research areas, including marketing [9], consumer behaviour [8,10,11], psychology [12], material culture [13] , Human-Computer Interaction [14,15,16,17,18,19,20] and design [21*,22,23,24,25,26*,27,28**), bearing relevance to both theoretical development and real-world applications. One of the most prominent examples of this can be seen in attachment literature that explores the value and meaning of possessions. Associating an object with personal memories has been found to be a primary determinant for attachment experiences [11,12,25,27,29] and has served as a source of inspiration for several design approaches to promoting object attachment [16,20,26*,30,31].

The qualities of possessions as external *things* that surround us throughout our day-to-day lives offer unique opportunities to exercise a level of control over our memories. Archiving, displaying or using possessions within the home that cue memories allows us to connect with the past, bringing it closer to the present or to store it away, giving us permission to forget [32,33].
As physical possessions age, they form patinas (a film, gloss or sheen) and traces of use that reinforce their shared history with the owner [28**,34]. These tangible qualities allow physical possessions to accumulate memory cues not only to episodic events, but also to time periods, places and felt experiences. Conversely, the intangible nature of digital possessions can hinder the process of forming connections with associative forms of memory, lacking ties to the surrounding material world [10,14,35,36]. Digital possessions do however provide new opportunities for sharing memories [37] and creating high-fidelity memory cues [38].

Connection type 2 (C2): Memories expressed through a possession
In this connection type, a relation between the possessions and memories has been established and the possession represents or can cue one or more memories. A strong connection to memories is known to be contributing to object attachment. Possessions that we keep for remembering purposes, such as souvenirs and personal photos fit this category. Research in this area, however, has shown that these 'cued responses' do not always fit the classic definition of an episodic memory, but cover variations such as associations, or personal reflections [4,17,39*].
Researchers in Human-Computer Interaction have investigated the *nature of this relation*, such as the possession as 'cue' [40] and the resulting remembering experience [41] and the variety of responses possessions cue [39*]. Simultaneously, in consumer research, the relation between possessions and identity has been a topic of investigation [42,43*], not only for physical possessions, but also for digital possessions, or even not self-owned digital objects such as avatars [8,14,37].

The ability of possessions to cue memories has many advantages, but can also have an *adverse effect*. One of them is that persons with hoarding problems have difficulties letting go of possessions, because they are afraid of losing the associated memories [44,45]. Another situation where memory cuing is undesired is when experiencing grief, such as

death and divorce, and researchers in HCI have studied these practices of disposal or representation, in particular for digital possessions [46,47].

Researchers have investigated current practices of *preserving memories or possessions,* now or in the future [18,48,49]. Also practices and self-defining memory cues among *older adults* have been investigated [50,51,52*].

Psychology researchers who investigated the *potential of social media as cues*, have mostly found positive effects on remembering [53,54]. However, the research on current practices discussed earlier, found that digital possessions are generally less valued and that its digital nature can hinder the ease of access [10]. In Design and Human-Computer Interaction, numerous research examples have been published presenting *research prototypes* that aim to facilitate current practices of preserving memories or to enhance the remembering experiences, as digitisation has simultaneously created new opportunities and impoverished cued remembering [55,56,57].

Connection type 3 (C3): Possessions lose memories

Just as possessions often acquire connections to memories, they also lose their ties with memories, consequentially diminishing the strength of the owner's attachment. This disconnection between possessions and memories can occur through dispossession, transformation, or inaccessibility of the memory such as forgetting. Key literature that explores this disconnect in various forms includes works related to family heirlooms [21*,50,58,59] and non-personal possessions [60].

While forgetting is an essential part of human memory [61] , literature addressing the relationship between possessions and memories rarely acknowledges its occurrence, instead highlighting the ways in which possessions are used to actively prevent forgetting [38] or misremembering [62] and at times must be disposed of as a means to facilitate intentional forgetting [47].

As people grow older, they often engage in acts of posterity, including passing on their memories to younger family members [50]. Heirlooms often serve as vessels for which people pass on their autobiographical memories, becoming a source of attachment for their ability to maintain connections to a past that extends beyond a single lifetime [21*,63]. Recent studies have explored the potential for technology to support the passing on of personal history through technological heirlooms [64] or more broadly in commercial applications such as tagging donated second-hand clothing with stories from its previous owner [60].

Connection type 4 (C4): Memories lose possessions

"For years, I searched for things that I 'couldn't find', only to realise that they were from the time before the blast, and therefore irretrievably lost"[1], says a man who lost his home and possessions after a firework warehouse exploded over twenty years ago. Victims of theft or

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[1] Translated from Dutch: Marijnissen, H. (13 May 2020). Twintig jaar na de vuurwerkramp in Enschede zijn Jos en Herman vooral blij dat ze leven. Trouw. Retrieved from https://www.trouw.nl/binnenland/twintig-jaar-na-de-vuurwerkramp-in-enschede-zijn-jos-en-herman-vooral-blij-dat-ze-leven~b4bd185e/

natural disaster often go through a process of grief similar to that of losing a loved one. However, the original owner will still have the memories, sometimes including memories of the possessions, even though access to the memories might have become harder. Research in this connection type has focused on the effect of the loss or explored how an otherwise lost memory cue, the object we were attached to, can be replaced or transformed. For example, how objects once owned, but lost when moving into a care home, are still remembered [43*,51]. Other impairment of the possession-memory relation occurs when loved objects are broken or unused, causing a dilemma or guilt over keeping the object. Research in this area includes a design study which aimed to transform highly valued but broken objects [24], and an exploration of techniques to reduce object attachment by replacing cues for people's personal memories (e.g., by taking photos of the objects) to stimulate people to donate their unused possessions to a charity [65].

The distinctions we have drawn between *active* and *lost* connections between possessions and memories becomes blurred in the context of digital possessions such as music, texts or photos that are neither singular nor fixed in form. Cloud-based storage, hosted content, streaming services and subscription-based services reflect a transition to *access* rather than *ownership* of our possessions [3,37,66]. In this access-based model of possession, memories are not tied to one specific instantiation of a digital file but are instead tied to any instantiation and therefore live on when the original digital possession is lost or deleted [14,15].

Discussion

Possessions and memories can be connected to each other in various ways. The four connection types introduced in this paper are used to provide lenses onto the relevant research areas. These lenses are quite artificial in that the connections between possessions and memories is highly organic, they can change easily and quickly. One object or one memory might go through all four connection types during their lifetimes, which would be an interesting avenue for future research, seemingly unexplored.

As Human-Computer Interaction researchers, our focus and expertise is primarily framed within the scope of C1 and C2, instances in which there are active connections between possessions and memories. Our exposure to research addressing the loss of connection between possessions and memories (C3 and C4) is less prominent, however we believe those to be underrepresented.

From a Human-Computer Interaction perspective, there is a lot to be gained to study possessions and memories in collaboration with other disciplines. HCI can inform other fields through rich descriptions of all sorts, including real-world experiences of different groups of people, application areas, in-depth case studies, creative perspectives and solutions, interventions, design ideas and working prototypes. HCI can show the *current* role of technology in and it can provide and shape visions of the *future* of where developments might go and what they could look like.

Conclusions

People often become attached to an object because of the memories it brings to mind. This has led many researchers to focus their attention on various types of connections between possessions and memories as an avenue for exploring ways of influencing attachment experiences in real-world scenarios. The review presented in this paper shows a myriad of possible links and relations between possessions and memories, which can vary over time, context, use and across owners. The division of these possibilities in just four groups, shows how different the perspectives are and fields that study them across this multi-disciplinary research topic. Connection type 1 focuses on possessions that have acquired connections with memories, and the research is understandably dominated by artefact-focused fields, such as design and material culture. Connection type 2 focuses on memories and how they can be expressed through possessions, which is predominantly studied by behaviour-focused fields, such as psychology and marketing. For Connection type 3, where possessions have lost the connection with memories temporarily or permanently, the interest has come from gerontology-related fields, including topics such as ageing, forgetting and heirlooms. While for Connection type 4, where the possessions that once expressed memories have been lost, the interest comes from sociological and behaviour-focused fields.
Some fields study several Connection types, including attachment, identity, consumer behaviour and Human-Computer Interaction.

The research presented in this paper is by no means exhaustive, but we have shown there is a lot of interest into possessions and memories from different fields. Storytelling and communicating our experiences have always been important for both survival and community building, and a long-standing topic of research. With ongoing technological developments and the move into the digital realm new fields have joined in studying these more recent possibilities and challenges, making research into possessions and memories more relevant than ever.

Conflict of interest statement

Acknowledgements

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