



Understanding Practices Surrounding Childhood Mementos to Inform the Design of Interactive Technology and Sentimental Record-Keeping

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ABSTRACT

The saving of childhood mementos is a common practice that has existed for many generations across different cultures. Parents often save physical objects such as baby blankets, toys, or clothing. Designers of interactive technology have the opportunity to learn from and augment the practices surrounding the selecting, saving, sharing, and savoring of these physical objects. To understand the design opportunities for this space, we conducted artifact-based interviews and surveys with parents about the mementos they have saved from their own childhood and are currently saving for their young children. Themes emerged surrounding preserving and using mementos, qualities that imbue value to mementos, meanings associated with sharing mementos, and tensions around saving, clutter, and discarding. The themes highlight qualities of ambivalence and ambiguity surrounding sentimental behavior. We discuss these themes and apply the findings to the design of a new feature of an interactive system for tracking children's data.

Keywords

Childhood mementos; baby mementos; keepsakes; photos; baby boxes; children; families; parents; mothers; fathers; domestic computing; materiality; qualitative methods.

1. INTRODUCTION

Saving mementos from childhood is a widespread cultural practice. Many parents often save items from their child's early years, such as their first pair of shoes, a security blanket or lovey, a photo album, or a hospital bracelet from the day of their birth. These objects are often sentimental in nature and are saved for numerous reasons. Parents may save objects for themselves, for their child to have when they are older, or both. Simultaneously, interactive technology is increasingly becoming part of sentimental behavior (e.g., [14]). From supporting archives of photos, for example, to supporting shared family engagement with the systems and devices that house those photos—moments of sharing that include interaction with others and with devices, moments that eventually become cherished memories themselves. The goal of this work is to inform the design of technologies that can support the practice of deciding to save, preserving, sharing, passing along, and discarding objects, while also providing an interactive experience for parents and children. Based on the results of a study of these practices, we determined design opportunities for interactive technology to support behavior around sentimental objects and apply the findings to the design of a new feature of an existing interactive system for tracking children's data.

A number of researchers have studied how tools can support the practices surrounding keeping of memories and sentimental ob-

jects (e.g., [11, 20, 19]). To inform their design, there have been several projects understanding the archival of family mementos to inform technology design [e.g., 8, 12, 21]. This work extends this literature by focusing on the issues surrounding the saving of mementos specifically of early childhood. This is an interesting area of focus due to a number of reasons: parents are often selecting the sentimental objects to be saved for someone who is not yet old enough to know what they may want later; the types of objects saved are often different in nature than other mementos, and often the concept of a "first" plays an important role at this time in a child's life; there are interesting notions of ownership, since parents save some objects for themselves and some for the child to have when they are older; and the child may have little say in what is saved for her. Finally, this is an interesting time to study this phenomenon as the current generation of parents grew up without computing technology, but their children will grow up with ample access to it.

We focus on parents' and children's sentimental objects for the reasons described above, with a focus on physical objects since there have already been tools to support children's health records (e.g., [10]), their daily activities (e.g., [17]), and their digital photos and memories (e.g., [26]).

To understand the ways that parents and children currently save and handle sentimental childhood objects, we conducted a formative study consisting of interviews with 16 parents and 10 children and two surveys of 160 people about the mementos they have saved from their own and their children's baby years, focusing on reasons for saving and levels of access and engagement with mementos. We discuss tensions between the desire to save objects and the desire for less clutter and how the study findings can be applied to the design of an interactive system.

2. RELATED WORK

Our study of childhood mementos touches on several lines of inquiry taken up in the past few years focused on objects in the home. We overview that work and describe related work in designing technology for children and parents.

2.1 Objects in the Home

Previous work has looked at objects in the home by focusing on current archiving practices [e.g., 12, 21], creating artificial archiving scenarios [8, 20], or introducing new archiving systems and devices into homes [11, 26]. Stevens, et al. [26], cite a technical report providing the results of an interview study with parents, findings from which inform the design of their Living Memory Box. Our study is similar in its focus on parents, but offers a unique angle: in addition to mementos from the child's baby years, we also focused on mementos from the parents' childhoods. Kirk

and Sellen [12] similarly focus on cherished objects, where they investigated sentimental artifacts in the home. Our work brings together Stevens et al.’s [26] focus on parents with children and Kirk & Sellen’s [12] focus on sentimental artifacts and extends it by looking specifically at mementos from early childhood for both parents and children.

By supporting and affording interaction around these home archives, much of the work on home archiving has the implicit goal of supporting reflection and reminiscence, whether by offering built or conceptual designs [8, 20, 11, 26] or by offering design implications based on more analytical investigations of home archiving practices [12]. Other work has focused explicitly on reminiscence and reflection [18, 23]. Odom et al., conducted research motivated sustainability [16] where they unpacked meanings associated with personal inventories and objects in the home to which participants have varying degrees of attachment [2].

2.2 Designing Technology for Children and Parents

Research for designing interactive technology for children, parents, and families has been common for some time. Research topics have included interactive games for children, family communication tools, family calendaring systems, tools for promoting children’s health, and more.

The inspiration for this work is a project called Baby Steps [10], which is a tool for helping parents to track developmental milestones in their young children. To motivate the health-oriented tracking and make the tracking less medical and more fun, the Baby Steps system also encourages parents to keep sentimental records along side developmental information. Because of an observation that parents do not exclusively track things in the digital domain, we were interested in understanding the types of sentimental objects that may not be able to be captured by such a system to inspire new designs that could integrate physical objects into such an archive. Additional types of child capture devices include KidCam [9], a tool for capturing unplanned moments in a child’s life, and SenseCam, which has been used to capture moments throughout a non-verbal child’s day [5]. These systems focus on capturing digital photos of children, whereas we were interested in physical objects.

Additional family support tools include SPARCS [4], a system for sharing digital photos within families, and LINC [15], a family calendaring tool. There are also a number of interactive systems that support adult-child communication, such as for children of

divorced families [28] or sharing stories with remote family [22]. While most of these tools support communication through purely digital means, some tools have supported interaction with physical objects, such as ShareTable [29], which uses a remote projection to show how someone is interacting with a physical object remotely, the Living Memory Box [26], which allows for storage and sharing of childhood objects, and the Peek-a-Drawer, which allows children to send photos of physical objects in a drawer to remote family [25]. Our work aims to increase knowledge about the experiences these types of systems are meant to support and offer designs for these experiences that can fit into existing systems already in use.

3. METHODS

To understand parents’ relationships with childhood mementos, we conducted a qualitative study that consisted of interviews and surveys on the mementos parents have saved for their children and from their own childhood. Different from all previous research on mementos and objects, we focus our study on mementos considered by participants to be specifically baby or childhood mementos, from both the parent’s childhood and their children’s. By asking participants to discuss their own mementos, saved by their parents, in addition to discussing the mementos of their children’s they were saving, participants were able to imagine a future when their children would receive these saved mementos, and thus view their own and their children’s mementos in a uniquely nuanced way.

3.1 Interviews

We conducted 13 interviews in participants’ homes. Interviews were conducted with 16 parents (13 mothers, 3 fathers; ages 28-47) of 22 children (ages 1.5-16). Children were invited to participate, and 9 children (ages 3-9) participated to varying degrees, with 4 older children (7+ years) participating more fully. We recruited parents via word-of-mouth, on parent-related listservs, and on Craigslist. We compensated each family with a \$25 gift card to the online store of their choice. Parents were invited to ask their children to participate if they would like, and children from 5 families participated in the interviews as appropriate. In 4 interviews, both parents participated in the interview, but in others, only the mother participated. Before arriving at their home, we asked parents to pre-select mementos from both their own and their children’s childhoods, which allowed them time to consider what they felt was most important to share and to retrieve items that may have been in storage. The interview questions focused on stories of mementos parents chose to bring out to show and discuss. We asked about the group of items as a whole—regarding storage, plans for them, levels of access and engagement, and feelings about all of these, as well as each object individually—the story of the item, why it was special to them, why they were saving it, how they would feel if it was lost, if it could be replicated, and follow-up questions as appropriate to gather rich data. Since many of the children participants were very young, we asked basic questions about their favorite objects and why the objects were special to them. We photographed each object the parents selected from their own childhood as well as their children’s mementos.

3.2 Surveys

To triangulate our results from the in-person interviews, we also conducted two different online surveys. One survey was targeted toward adults who were asked to reflect upon a single object they valued from their own childhood. The second survey was targeted toward parents of children under the age of 8 and focused on a

Table 1: Respondent demographics for two online surveys.

| Adult Survey on Own Childhood Mementos (n=91) | |
|--|--|
| Age | 18-24 (26%), 24-34 (43%), 35-44 (21%), 45-54 (8%), 55-64 (2%) |
| Gender | Male (32%), Female (68%) |
| Parent Survey on Child’s Mementos (n=69) | |
| Age | 18-24 (10%), 24-34 (45%), 35-44 (29%), 45-54 (12%), 55-64 (4%) |
| Gender | Male (25%), Female (75%) |
| # Children | Average: 2.0, Std. Dev: 1.1, Min: 1, Max: 6, Median: 2 |
| Child’s Age | Average: 8.7, Std. Dev: 7, Min: 0, Max: 25, Median: 6 |

single memento they have saved or are saving from their children’s childhood. Surveys questions included both open-ended and closed-ended questions and included the classification of the object, why they consider it special, where it is stored, how long they have had it, and how often they thought about it or interacted with it. We recruited participants via Amazon’s Mechanical Turk (AMT) and paid \$0.20 per response. Participants were restricted to the United States, had to have an approval rating of at least 95% on AMT, were required to successfully answer a screener question, and could only take the survey once. The survey was hosted on surveygizmo.com, which allowed us to also confirm the location where participants completed the survey and delete any non-US responses. Originally, we required respondents to upload a photo of their memento, which resulted in few responses. After removing this requirement, we received more responses. After filtering invalid responses, we recruited a total of 91 participants for the adult survey about their own childhood mementos (with 30 uploading a photo) and 69 participants for the parent survey about their young child’s mementos (with 21 uploading a photo). We were not seeking statistical significance, but instead aimed to broaden the qualitative data beyond just our interviewees. Table 1 shows an overview of respondent demographics.

3.3 Data Analysis

We audio recorded and transcribed each interview and analyzed data using grounded theory approach, as outlined in [27]. Three researchers open-coded the transcripts for themes, then over a series of meetings discussed and agreed upon the main themes. These main themes were used to guide closed coding of transcripts and survey data, which resulted in memos on each theme. We describe the themes in the next section, including representative quotations.

4. What Are Baby Mementos?

We did not have a pre-set definition for what a baby memento could be and allowed our participants to self-define, by allowing them to choose whatever they wished. In our surveys, we asked participants to, “Think of 1 object that you have saved from your child’s early years” (for children’s objects), or, “Think of 1 object

that has been saved from your childhood and describe that item” (for their own objects from their childhood). We did not suggest particular items when we asked them to select objects so as not to bias them in their selection. While we use the term “memento” throughout the paper, some people referred to items as keepsakes, sentimental objects, or other phrases, and we intended to include anything participants would consider saving from their childhood for any reason. Our survey and interview questions did allow for insight beyond mementos themselves, including reasons why people save, and why and when people access mementos, what they plan for their mementos, and the differences between these for parents’ own mementos and those they is saving for their own child.

The types of childhood mementos parents showed and described during interviews varied widely. We saw numerous plush animals, dolls, articles of clothing, baby blankets, books, photos and albums, toys, and handmade artwork. Some of the more unique items included pieces of furniture, a baby’s arm cast from a broken bone, home pregnancy tests, and VHS tapes. Figure 2 shows a small subset of the objects we photographed to illustrate the variety. For the survey respondents, we asked participants to describe the object and categorize it. Figure 1 shows a chart of the frequency of the different categories. Similar to the interviews, there were a large number of plush objects, blankets, toys, and clothing. Interestingly, there were some differences in the frequency between the two surveys. For example, nearly 40% of objects from the adults’ own childhood were plush objects, but only 20% of the current child’s objects were plush objects. Similarly, clothing made up over 20% of the items saved for a current child, but represented less than 5% of the objects saved by adults. The large number of categories marked “other” also illustrates the large variety of mementos. Some of the items that were listed as “other” included a hospital bracelet, lock of hair, trophy, costume, handmade item, music accessory, knife, video game, and sports memorabilia. Overall, participants reported saving few technology-oriented objects.

5. FINDINGS

The themes below were present across most or all interviews and surveys. Some themes are presented with striking exceptions that we feel are especially relevant to interactive system design. All names are pseudonyms.

5.1 Most mementos are stored away for preservation; others are nearby and in use

For both parents and children, mementos are usually stored away, most often in boxes, including hope chests or “big plastic tubs.” Memento boxes are located in storage places like children’s or parents’ closets, attics, or garages. Some parents use boxes as a way to constrain their saving. Parents’ mementos are also stored in boxes, whether at their homes or their parents’. That mementos are stored in boxes may not be the most surprising of findings, but it is a finding that is an artifact of our particular study design, focusing on baby mementos. This differs from what other memento-related research has shown in home tours (e.g., [12]) and Odom et al. [16], who asked about “items you love” in general, both of whom looked at objects throughout the home. Mementos are stored away in boxes to keep them organized as well as to preserve them.

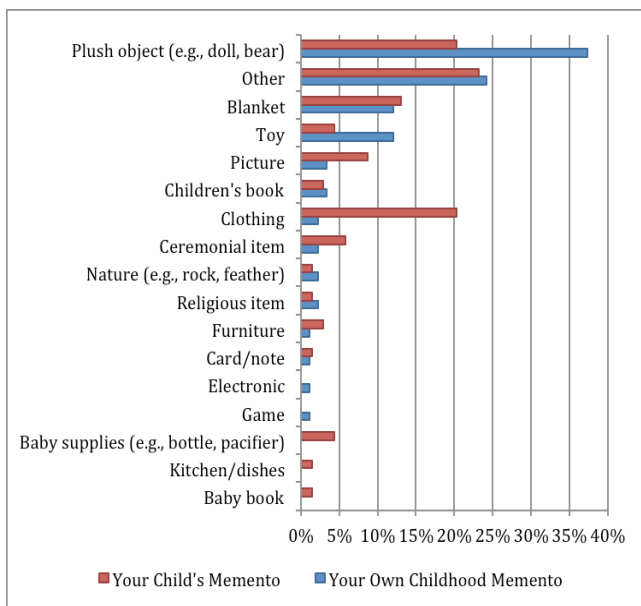


Figure 1: Categorization of objects saved by survey respondents



Figure 2: A pillow a child made; an early set of shoes, whose material quality the parent loved; a parents' VHS tapes of high school band; a parents' book now used by the children, held together with tape; a parent's bead collection.

Other mementos are in use, including frequently used things like books and clothing (e.g., Halloween costumes that stay in a dress-up box) and infrequently used things like photo albums that sit on shelves. Ida nicely articulated her reasons for keeping mementos accessible:

"Certainly a lot of people keep special things stored away so they don't get broken or lost or damaged, but to me the point of keeping it is because I like the way it makes me feel to see it, I mean to have it and to remember it, it's like if it's in a box I kind of forget that I even have it so I'm not really benefiting, I'm not really getting anything from having it in a box in the basement."

In this quotation, the parent keeps the mementos out because of how seeing them makes her feel. Parents also keep mementos out for their children to interact with, like Jess, whose children play with an old set of keys.

Overall, whether parents store mementos away or keep them in use is more influenced by the *parents' approach* to memento preservation than by the *type of memento*, though some mementos, such as birth stories, clothes worn during the trip home from the hospital, or hair clippings simply are not "useful." Like Ida's quote above says, some parents see value in saving the memento and having it last, while others see value in their children interacting with it.

5.2 Parents and children rarely interact with stored mementos

Parents and children rarely interact with mementos, but would not get rid of them. When asked how they felt about their level of engagement with mementos, their own and their children's, most participants said they were comfortable, though two said they would like increased engagement.

Participants interact with mementos at two main points: when they need to get something out for a specific reason, such as for a class project, or when they are moving. Moving was an important time for engaging with mementos for all of our participants. It was at this time that they made decisions about what to keep and what to discard. Interestingly, moving is also important for parents' mementos from their own childhood. Many participants received the mementos their parents had saved for them when they moved into their first home, and some participants received mementos when their parents moved.

5.2.1 Exception to 1 and 2: Facebook photos are stored, in use, and interacted with

Only one participant discussed Facebook photos as a dominant type of memento, but for her, Facebook is a way to both store and use photos of her son: Mel uses Facebook as her catalog of photos; this is where she goes, often with her son, to look back on his childhood. Using a public service such as Facebook in this way has led Mel to make particular decisions regarding capture and access. She described how she not only does not upload everything she might capture, such as photos of her son bathing, be-

cause they are not socially acceptable, but that she *"probably just won't take the video to be honest."* Mel also said she looks at photos more on Facebook than she would if they were saved in folders on her hard drive, since she is already on Facebook, which makes them feel more accessible and less hidden.

5.3 Making or saving a memento imbues value

Many participants included the handmade property of a memento when explaining its specialness. While all participants mentioned material aspects of some mementos when describing their specialness, it is not just that an object is handmade that makes it special—it is that it *was made*, and by someone important, either the parent herself or someone close to the parent or child. Mel, a parent, said looking at her own baby book *"made me feel special. It made me feel like my mom took the time to write about it, you know?"*

The act of saving itself also makes objects special. The perspective that sees an object as special because it was saved comes from both the recipient (child) and the "saver" (parent). Cassandra described her son's box of mementos to him during our interview: *"This bin is all your stuff from when you were a baby that Mommy's been saving."* This short quotation indicates that it is not only the "stuff" that is special, but that "Mommy's been saving" it.

Many parents expressed wonder at the objects their own parents decided to save for them, frequently questioning out loud to us their parents' decision to save a particular object. This confusion did not mean the objects their parents saved are not special; they are. This highlights the importance of the act of saving: even while participants wondered, they felt a sense of responsibility toward and appreciation for the objects their parents saved for them.

5.4 Parents keep milestone records, and the format of record keeping matters

Related to the previous finding, one thing all parents but one described creating is some version of a baby book, journal, or other form of milestone recording-keeping, such as a calendar with short entries for each day. In all cases, parents cared about choosing a format, rather than using "just any" book, such as one given as a gift. Parents keep these records for anticipated nostalgia and as memory aids. Sharon describes the function of records she has kept, explaining how recording milestones helps capture them during a time when so much is happening so quickly:

"And I just really, like, I don't want to forget all these amazing little milestones and things, 'cause especially that first year is so packed with them, back to back to back, that and you're so exhausted and overwhelmed that if you don't write it down somewhere, do something like that, you aren't gonna remember it."

For recording these quickly-happening milestones, some parents prefer blank pages, like in scrapbooks, because they desire the freedom page to record what they wish. Other parents, especially with their first child, expressed appreciation for fill-in-the-blank

books because they are unsure what information to record and feel some pressure to record the “right” information. Two other participants turned to calendars for record-keeping because the small size of the day on the calendar provided a welcome constraint to the amount that can be written. Ida read from her calendar:

“Walked down town with momma and poppa. Went to Apricots for dessert. Mama started a ballet class and poppa babysat.” I just love it. This is one of my most cherished ones. This is my whole first year. I think my favorite thing about it is that it’s not like—it also has, ‘You crawled, you sat,’ it has that stuff. But I love that it’s just like the regular stuff. ‘Here’s what we had for dinner.’”

In addition to the short entries, Ida explains how special having a record of the mundane is. All parents keep records, of milestones or the mundane (or both); however, aligning with common knowledge, the extent of records is different with each additional child.

5.5 Mementos cannot be replicated

For each memento, we asked how the parent would feel if he or she lost it, and if a digital photo or copy of the memento would be a sufficient replacement. In general, parents felt a photo would be a welcome back-up record of the object, but would suffice only if necessary and certainly could not replicate a memento. Mel expressed the reason simply: *“No. I mean, you can’t use a photo.”* In addition to not being able to interact with mementos, a photo or copy of a memento is not the memento itself, and therefore has none of its physical properties or history. As described in Finding 3, sometimes it is the material qualities and the acts of making and/or saving a memento make it special.

Furthermore, some mementos, like baby books, themselves contain mementos. Jess responded like other participants to what it would be like to lose her children’s mementos, including the scrapbook-like baby books she made:

“I think the baby books would be the hardest, because that would be something I put a lot of energy into. It is a repository of so many memories and milestones that, yes, you can recreate it to a point because you have the digital images saved in a computer, but it’s just, I have in there the pregnancy test and the umbilical cord. Everything.”

Jess explains a digital re-creation could offer a copy of the pages, but not the contents of the book. Furthermore, the making of the book matters, and to lose the object would be, in a sense, to lose that effort.

5.5.1 Exception: A printed digital photobook could be replicated

While Jess handmade scrapbooks for each child, she also created a printed photobook of her son with a coupon she received. The photobook has been popular in her home with her family and visitors, yet, in Jess’s opinion, is different in kind from the scrapbooks she made:

“And where I’ve put captions in that [photobook], yeah, that’s handwritten, yeah, that makes it even more personal, but I feel much more comfortable recreating—if I lost this, like, ‘Okay, that’s a bummer,’ but I think I can go back through and redo it. If I had to. If I was going to reproduce it for somebody else, I’d just need to write down what was on what pages, where I put these captions.”

The original form of this memento was always digital, so creating another copy from the original is staying true to its original form. The exception, though, is her handwritten annotations, which

could not be recreated in a copy or new printing, but would have to be actually rewritten.

5.6 Parents keep mementos tied to (memories of) special times, places, people, and relationships

Mementos can be special in and of themselves, and also for what they represent. Parents keep mementos tied to special times, places, people, and relationships; this is in line with other work (e.g., [12]). These categories are of course not mutually exclusive, and mementos may fall into more than one category or all. “Relationships” here refers to non-human relationships, such as the relationship many children have with their *lovey*—their most-cherished childhood toy, often a plush animal or blanket. In addition to connecting with the past, parents keep mementos to evoke memories, in themselves and their children, of the special referents with which the mementos are associated: *“I guess the memories that are tied to the objects, like when I look at something, each of these things, when I look at it, kind of tells me a story that I may otherwise forget, so it sort of jogs my memory.”* (Ida)

Ida expresses a common sentiment—that sometimes the mementos serve to evoke memories that otherwise may not be evoked. At the same time, all parents, for at least one memento, expressed extremely emotional responses at the mere thought of losing a particular memento, often becoming flushed and struggling for words. Parents revealed strong relationships to both the memories associated with the mementos and the mementos themselves.

5.7 Parents mentioned many soft and paper objects, rarely electronic or digital mementos

Of the mementos participants chose to discuss, many were soft; very few were electronic or digital. Most were three-dimensional: soft objects, such as plush animals and clothes; some toys; and, interestingly, body parts, such as hair clippings, teeth, and umbilical cord stumps. All parents mentioned at least one memento that was special because it represented the tiny size of the baby their child used to be, explaining how quickly children grow and how easy it is to forget how small they were: *“It’s hard to give away the pair of pajamas that made you the happiest when you saw him in them. But then also because when they get bigger, it’s hard to remember they were that small. He’s already slipping away from me. He’s not quite six. So I want to remember that he fit into something small”* (Katherine).

Many mementos were “2½D” [12], such as photos and other paper documents, which usually represented achievements. Parents rarely mentioned electronic or digital mementos unprompted, but when prompted, many mentioned digital photos or videos, often simultaneously expressing feeling overwhelmed by huge digital libraries. A few participants had old electronic mementos, such as Ali’s VHS tapes of her high school band (shown in Figure 2), but expressed very little attachment to them.

5.7.1 Exception: Mel’s Facebook photos; Amy’s blog

Two of our youngest participants, 28-year-old Mel, whose Facebook photos were discussed earlier, and 31-year-old Amy, offered strong exceptions to this theme. Amy’s most prized memento is the blog she has been creating for about a year. What began as a Facebook page for her newborn daughter, *“morphed in the last half a year to year where it’s more about the family, our family in general.”* When asked how she would feel if the blog were lost, Amy offered an interesting response: *“Oh, that would suck, because I invested a lot of time in that. So, that would, yeah, that*

would be much more of a loss.” Here we can see echoes of other findings, including the value of record-keeping and of making things. Later, Amy implied that, when asked how she would feel if she lost it, she did not consider the possibility of losing it completely, since it is digital and stored online.

5.8 Parents share their own mementos with their children

Most participants described sharing their own mementos with their children. This sharing took place with and without the parent. In some cases, childhood toys (often saved by a grandparent) were given to children to use; in other cases parents and children interact together around a memento, such as reading a beloved childhood book together. About seeing her son use her old toys, Mel said, “*Maybe it’s a way for you to connect with your child a little bit, too. [...] Just – especially watching your kid have a really good time or really enjoy something and you know that you kind of made that happen. And you know first-hand what they’re feeling. You’re just so happy for them – you remember this feeling.*” For Mel and many other parents, seeing their child use their old toys or other mementos and using those mementos together is a source of positive emotion—happiness for their child—as well as a way to connect with their child and their own childhood.

5.9 Parents are not always sure what they will do with mementos

In addition to saving mementos for reasons described previously, almost all parents explained they were saving at least one memento in order to pass it along to their children, though parents expressed this with varying degrees of certainty. Some parents answered immediately to the question, “What do you plan to do with these [objects]?” that they planned on passing them down to their child(ren), such as Katherine, who said, “*You know, when they graduate and are on their own, I just plan to give it to them.*”

Much more common, however, were responses like these:

“*Keep in them in a box. [...] I don’t really have a big plan.*” – Cam

“*I’m not sure.*” – Ali

“*I don’t know. [...] I don’t have any collage planned [...] I guess at some point I will give them to her. Or something like that.*” – Amy

While all parents had clear reasons why a memento was special, most were much less sure what they would do with the memento in the future.

5.10 Ownership of mementos is ambiguous

Parents described their own mementos as being special not because they remember them, but because their parents saved them. In addition, many participants, when describing their child’s mementos, explained that they saved a particular memento because of what it meant to them, such as Cam’s mementos from the difficult and late-in-life birth of her daughter: “*Well I just thought that Sally might like to have them, and that I might like to have them actually. Just... forever. I guess I don’t know if I... I would give them to her if she wanted them, but otherwise I would keep them for myself.*” In another interesting example, Cassandra buys and saves Cars themed toys for her son, “*start[ing] a collection*” for him: they are technically the child’s objects, but they have never really been his, as she does not allow him to play with them. Cassandra views them as an investment she thinks will pay off when their worth increases in the future. Sometimes she does buy dupli-

cates so her son has one to play with, because he is aware of the collection and wants to play with it.

5.11 Parents experience a tension between saving and clutter

Most parents described a strong ambivalence about the amount of items they save. Most parents expressed feelings Ali explained well:

“*Again there’s a tension between loving that they’re all there and I can go back and try to show the kids pictures of different things and friends and events and whatever, but then on the other hand, it’s almost a weight. You still have to carry it around. Even if of course definitely more of a cognitive weight than a physical weight, but you’re like, ‘Oh, I know they’re all on here. I should go through them sometime and do something useful with them.’ But I don’t know what that useful thing would be. So, I think, you know, it’s almost better that I have these ones because they’ve been culled down and they’re just, it’s just very small.*”

The interesting thing about Ali’s explanation, however, is that she is referring to digital photos on her hard drive. The tension arises because parents want to make sure they are capturing or saving everything they “should,” in case they or their children will desire it in the future. The final line of Ali’s quotation indicates another common sentiment: curated or “culled down” collections, physical or digital, are more approachable because there is less to sift through.

5.12 Repurposing or giving away objects as- suages parents’ misgivings about discarding

Most participants feel a strong ambivalence about discarding items. Participants described alleviating the negative emotions associated with discarding items in two main ways. One is by repurposing them, as Jess describes in the following quotation:

“*I saw in this one craft book where a mom had made like a tree out of fabrics from the kid’s baby clothes, and I was like, that’s how, you know, when you have something that you love so much you can’t part with, like, you don’t necessarily want to give it away, or it is just so stained that you would be embarrassed to give it away, so it’s like, okay, so that’s the excuse I can use to hold on to it and make a little quilted design.*”

Another less painful way participants discard items is by giving them away. In general, giving away items to close friends or family members is most comfortable, followed by donating them to needier parents and lastly to thrift stores. No participants described throwing away mementos, and many participants in fact were visibly pained at the thought of losing mementos.

6. DISCUSSION

Parents and children have special relationships with baby and childhood mementos. Interviewing parents about the mementos they are saving for their children as well as mementos they have from their own childhood reveals interesting points of ambiguity and tension in parents’ feelings and behaviors surrounding mementos. As our findings show, mementos from early childhood are very special to parents. Many of our findings resonate with other similar work (e.g., [12, 21]), such as the importance of evoking meaningful memories [26], the salience of physical properties of mementos [26], and the irreplaceability or “rarity” [6] of mementos. Less expected, however, was the ambivalence and ambiguity associated with these highly meaningful mementos that are apparent throughout all stages, from saving to letting go. We explain the roles ambivalence and ambiguity played in our participants’ expe-

riences with their own and their children's mementos, then offer an example of a design informed by our findings.

Parents experience **ambivalence** regarding the number of mementos they save, especially when saving more means creating more clutter. At the same time, parents attempt to record as many milestones as they can or they think they "should," to be a "good parent," which consistently proves unsustainable as the child grows and as more children are born. One way that parents have found to manage both of these easily overwhelming jobs and associated feelings of ambivalence is through a type of form factor constraint. In the case of the number of mementos, many parents constrain the collection by limiting it to the size of the box in which it is stored. Some parents have similarly constrained their record-keeping by using calendars with small spaces in which to write. In these cases, the form factors the parents choose—a "big plastic tub," a calendar—assuage ambivalence through constraint; if they parents cannot save more, they will not feel guilty about not saving more. Finally, ambivalence is present for parents at the discard stage. As our findings show, parents assuage their ambivalence and painful feelings associated with discarding their children's mementos by repurposing them, such as sewing baby clothes into a quilt, or donating them to a close friend or family member or other families in need. In this way, they treat the mementos specially even in letting them go.

Ambiguity is apparent in issues surrounding ownership, and is an experience our study design was uniquely capable of uncovering. With parents "starting collections" for their children, receiving their "own" mementos from their parents that cause them to wonder why their parents saved the mementos they did, and unclear futures for the mementos that cause parents to shrug and say, "*I guess at some point I will give them to her. I don't know,*" ownership of mementos is clearly ambiguous. *Whose* memento is it? When a parent is saving a child's object, doing the work of saving it for when that child is an adult, then passing it along to an adult child who does not remember it, whose object is it actually? Rather than finding external methods for dealing with this ambiguity, the parents in our study expressed no concern for it; ambiguity in ownership seems to cause no concern when mementos can be easily pass on from parent to child.

6.1 Translating Findings to Design: Baby Steps

To illustrate how the findings from our study can translate into the design of an interactive system, we have applied them to create a new feature within an existing system our research group has been developing. We chose to integrate our findings into an existing system currently in use, rather than create new "digital mementos" [3, 19], because, while digital mementos will certainly become more important, parents and children will continue value and save physical mementos as well. The system, called Baby Steps (previously mentioned in the related work), is an online portal for helping parents track their children's developmental progress, which can help possibly identify the early warning signs of developmental delay. Baby Steps currently includes a timeline for visualizing important events and milestones that include pictures and videos that can be shared via Facebook or other social media.

Based on our findings, we have designed an addition to the Baby Steps web portal that allows parents to record mementos they have saved for their child. This is intended to supplement their memento behavior rather than replace it, since one of our findings indicated that mementos could not be replicated, but that photos served as a nice record of physical objects (Finding 5). Figure 3

shows a mock-up of the design ideas; each annotation is reference in the text, where we describe how each feature was directly informed by the results of our study.

6.1.1 *Allowing parents to track what objects they have saved*

We found that parents often keep objects in storage (Finding 1) and rarely interact with them (Finding 2). We envision a "digital hope chest" for each child in the family, where parents can upload pictures of items as they save them (Figure 3, A & B). This will allow parents and children to more frequently "access" and reflect on them with their children without having to retrieve them from storage or worry about damaging them. However, some parents were fine with not having frequent access, so this feature would be optional. We envision some constraints within the system that would help parents curate a collection, rather than save everything (Finding 1).

6.1.2 *Providing guidance on what to save*

To help parents prioritize what to save to help reduce clutter (Finding 11) and provide guidance on what might be important (Finding 4), we propose a component that provides ideas on what to save (Figure 3, C&D). One idea is to have computer vision algorithms identify objects that commonly appear in other images uploaded by the parent (Figure 3, C). Another is a form of "crowd-sourced" list of ideas that shows common and unique items saved by other users of the Baby Steps system (Figure 3, D). Although parents in our study did not necessarily seem to be at a loss for what to save, this may help give guidance on the most important items to prioritize when space is limited.

6.1.3 *Encouraging activities that help create mementos*

Because many parents felt that the act of creating a memento, such as a scrapbook or knitted blanket, helped imbue value (Finding 3), one feature we envision adding to Baby Steps is to encourage activities that follow this practice (Figure 3, E). This may include tutorials for making a pair of booties or creating an album for a child's future wedding or graduation party. We also envision activities that could help parents enter their own mementos and encourage them to save similar objects for their children for a cross-generational archive. Furthermore, we take a meta-view of this feature, an imagine a Camtasia-like feature that can record screen contents as well as faces, via the webcam, so that the act of sharing this content together can itself become a meaningful memento.

6.1.4 *Encouraging active reflection during the saving process*

Because of the amount of ambiguity and ambivalence in the memento-saving process (Finding 9, Discussion), one strategy to help bring more clarity to this process is to provide active reflection at the time of saving (Figure 3, F & H). We envision the add dialogue for new saved items to contain questions such as, "Why is this object special?" and, "What do you plan on doing with this object?" This dialogue would also allow parents to capture contextual information (Figure 3, G) about the object, as that is also something we found that parents were interested in preserving (Finding 6).

6.1.5 *Providing opportunities for passing along saved objects*

One of our findings was that parents often had misgivings on the thought of parting with their objects. However, if there were op-

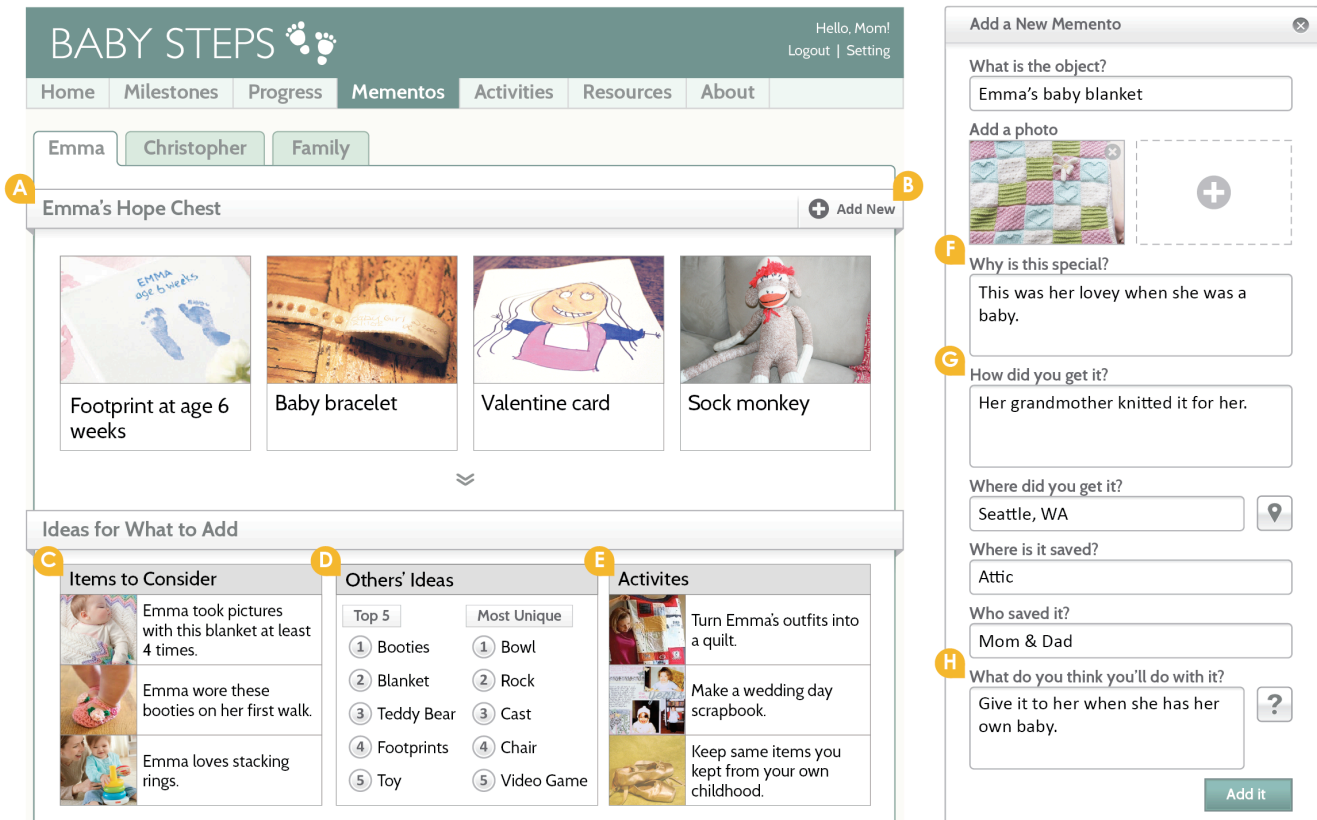


Figure 3: Mockup of “Mementos” feature in Baby Steps web portal, with main website (left) and add new item dialogue (right).

opportunities to repurpose or give away objects, this would help assuage that feeling (Finding 12). One added component to Baby Steps could be to provide suggestions for ideas for repurposing old items, such as making a quilt out of baby clothes (Figure 3, E) or a list of local organizations that would make use of used baby items. In addition, a social-sharing component could allow Baby Steps users to offer items to other users who are in need.

6.2 Study Limitations and Areas for Future Work

Although we believe our study has provided a number of interesting findings and design insights, there are several limitations that we address. First, our study population was limited to participants in the United States, and all interview participants came from a single metropolitan area. In addition, as others have identified [24], recruiting study participants via Mechanical Turk can provide for a somewhat biased sample that should be acknowledged. Finally, the survey design, which was provided to reach a broader set of people than we could recruit locally, was not recruited evenly, as we did not necessarily guarantee that adults responding about their own childhood objects also had children themselves, unlike in our interview study.

Future work in this space would address some of these limitations by recruiting a more culturally diverse sample; there are interesting and significant cultural differences between our sample and parents and children from other countries. For example, space to store items may be more limited, there are cultural norms supporting design of objects to last for generations, and different attitudes toward parenting.

7. Conclusions

In this paper, we presented the results of a qualitative study of parents with young children regarding the mementos they have from their own childhood and their child’s baby years. We found most mementos are stored for preservation, in storage containers that constrain the amount that can be saved, while some other mementos are kept nearby and in use due to the emotions they evoke and in alignment with parents’ values. We found the creation of a memento—whether it was made or saved—imbues values into the memento for both parents and children. We found record-keeping was highly important to parents yet it was laced with feelings of guilt about not being able to record everything. Some parents managed this overwhelming task by constraining the size of the recorded entries. We found that, because both the history and the physical properties of baby and childhood mementos are valuable, mementos cannot be replicated. However, we also found that mementos that began digital could be replicated and retain their meaning. We found parents and children enjoy sharing parents’ childhood mementos together. We uncovered an interesting lack of clarity regarding the future of the mementos, which in turn relates to a lack of clarity in ownership of mementos in the future. Finally, parents experience a tension between saving and clutter, and assuage the pain associated with discarding items by repurposing them or passing them along to someone close or someone in need. All of these findings point to ambiguity and ambivalence surrounding mementos that have received little research attention to date. We apply the findings to the design of an existing interactive system, which we hope will inspire future design research in the area of baby and childhood mementos and interactive technology. Like our participants’ mementos do for

them, our findings and design ideas prompt researchers to think of things they may not otherwise: the presence of ambivalence and ambiguity in parents' and children's experiences with mementos.

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