

Spirits in the Material World: Older Adults' Personal Curation of Memory Artifacts

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Memory artifacts are personal and collective belongings that elicit deliberate or involuntary memories. They are significant as objects of continuity, vessels for identity, and links to past relationships and history—for individuals, families, and communities. Drawing from in-depth interviews and cultural probe sessions with 16 individuals over 65, we consider how older adults curate and interact with their personal artifacts that embody and inform memory. Participants' hands-on experiences with memory artifacts uncover a heterogeneous set of personal curation practices and identify tensions that result from the competing goals of creating a legible narrative or legacy for themselves, their family, and their communities. The transition from physical to digital memory artifacts often perpetuates tension but can also create moments of reflection. These findings contribute a set of design considerations for supporting curation practices. This paper joins and expands upon CSCW scholarship regarding the importance of memory artifacts and the ongoing challenges of retaining individual memory and history over time, which, if managed effectively, can benefit and sustain family and community history at large.

CCS Concepts: • **Human-centered computing** → **Computer supported cooperative work**; • **Social and professional topics** → **Seniors**.

Additional Key Words and Phrases: memory, forgetting, memory artifacts, older adults, family, community

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1 INTRODUCTION

We exist in a world of mirrors: if we break them we disappear at the same stroke.

—Chris Marker (1951) [63]

Historian Pierre Nora said, “memory is alive, always carried by the living” [66]. For the individual, memories are an essential component of aging, continuity, and well-being [3, 95]. For family, memories support a familial legacy, a narrative over time [45, 52, 59]. Culturally, memories contribute to a broader context of place and time, forming an integral backbone to support community history [43, 62]. Memories can be mediated through artifacts—these *memory artifacts* are personal and collective belongings that elicit deliberate or involuntary memories [106]. Artifacts like these are “companions to our emotional lives” [104, p.5].

Managing memory artifacts—and their associated memories and histories—requires one's careful curation efforts that include acts of selection, organization, divestment, and preservation. Previous

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work has noted the delicacy and precariousness of both personal curation [46, 105] and memory artifacts themselves [26, 69, 101]. This curation work is often undertaken by older adults [48, 58, 83]. In their curatorial acts, older adults “pass on personal and familial legacies, achieve symbolic immortality, ensure a good home for special objects and/or influence the future lives of others” [83, p.179].

Memory artifacts and curation practices have become increasingly mediated through ever-changing sociotechnical systems. In today’s digital age, large-scale technological platforms and algorithmic systems have transformed how we retain and organize memories, subtly reshaping our behaviors, relationships, and interactions through automated curation based on our individual actions [20, 42, 94, 100]. Such changes are indicative of a cultural shift in memory artifacts and their curation, as individuals transfer their memory artifacts to digital environments and employ digital technologies to inform interactions with these artifacts.

In sum, memory artifacts are significant to our personal, family, and cultural lives and curation is a necessary practice that older adults most often undertake. Both artifacts and practice have been significantly altered by contemporary technologies—these technologies modify “the context of encounter, of preservation, of transmission” [87, p.142] while previous research has questioned whether our technologies are sufficiently equipped to support the complexity of our social lives [81]. In this way, it is critical to understand 1) how older adults practice curation to manage memory artifacts, 2) how physical artifacts and curation practices differ (and do not differ) from digital artifacts and curation practices, 3) how different contexts influence and inform older adults’ curation practices, and 4) how technologies can be designed to better attend to current curation practices and the desires of older adults. Therefore, we posed these research questions (RQs):

- **RQ1:** What are older adults’ curation practices of memory artifacts?
- **RQ2:** How does personal curation affect the memory artifacts of older adults?
- **RQ3:** How does digitization affect older adults’ curation practices and memory artifacts?

To address these questions, we engaged 16 participants in a research study that consisted of an initial screening survey, two semi-structured interviews, and a cultural probe session that engaged participants in the hands-on scanning of memory artifacts. In conducting a multi-method study, we gained deeper insight into the situated practices, values, and contexts that inform personal curation and individuals’ relationships to their memory artifacts. It is our hope that our empirical findings add nuance and necessary context to the importance of considering memory artifacts. In providing extensive evidence of the current practices and social conditions of curation, we hope to uncover the preferences and needs of older adults in their curation work and how best to design for these practices.

This paper is structured as follows. In the findings section 4.1, we first describe in detail the personal curation practices of participants as being done for oneself, the family, and the community and how each practice presents different considerations for memory artifacts. In section 4.2., we then show how time influences participants’ feelings towards memory artifacts and how time affects personal curation practices, as health, memory, and artifacts all tend towards decline over time. Thereafter in section 4.3, we unpack participants’ practices of digitizing memory artifacts and how digitization can inform personal curation. In section 4.4, we highlight how participants do and do not preserve the context, meaning, and memories that are mediated by their memory artifacts and how these actions present challenges for future generations’ understandings of the artifacts themselves. Afterward, we summarize these findings and consider, in section 5.1, how these various feelings, responsibilities, and practices manifest points of tension and identify challenges to effective personal curation. Finally, in section 5.2., we suggest design considerations for future researchers and practitioners to design and improve systems that better curate, preserve, and sustain personal

and collective memory and history over time. These considerations include: raising awareness, supporting contextualization, supporting recontextualization, and supporting forgetting.

2 RELATED WORK

We situate this work within the scholarship of computer-supported cooperative work and human-computer interaction studies, memory studies, and aging research. In doing so, we triangulate the relationships between older adults, memory, and artifacts. Below, we define *memory artifacts* and *curation* within the context of this work and discuss the value of memory artifacts and curation to the individual, family, and community. In doing so, we present memory artifacts as boundary objects. By definition, a boundary object allows for a common point of reference that also has the flexibility to be interpreted and felt differently by different groups [97]. In our work, we extend this consideration. For older adult curators, the interpretive flexibility of their memory artifacts creates points of tension based on the different responses, relationships, and presumptions of these groups. We investigate curation in situ, often within the space of older adults' homes.

Additionally, we examine memory artifacts through their materiality and embodied interaction. In this section, we consider the distinction between physical and digital artifacts and how HCI and CSCW have examined multi-modal artifacts and their design. We also consider the embodied nature of curation—curation cannot be understood outside of its affective practice, as something always in the process of being done.

2.1 Value of Memory Artifacts and Curation

Definitions. In this work, we discuss memory artifacts and curation. *Memory artifacts* often begin as purely personal artifacts—any object, physical or digital, that can be tied to the individual. For instance, a watch, a photograph, or a letter. These artifacts can become *memory artifacts* when memory is externalized through the personal artifact. Here, memory artifacts are artifacts that mediate (embody and inform) memories or histories for an individual, family, or community. In short, memory artifacts create “islands of time” [106] to which memory-holders and memory-constructors can make pilgrimage. We conceptualize memory artifacts as “inseparable from who we are” [22] and important in defining and evolving the self, family, and community.

Curation is generally understood as the practice of assembling or gathering information in some form [115]. In sociotechnical curation, curation can be done automatically through collaborative filtering (like recommender systems) or through semantic or social analysis [39, 85]. In this paper's context, curation is a manual, individual process. As such, *personal curation* is any curatorial activity or process done by the individual with at-hand artifacts. Here, personal curation is done by older adults (65+) with their memory artifacts. Personal curation includes selection, organization, contextualization (the process of adding information), divestment (the process of getting rid of), and preservation (the process of saving) artifacts.

Value to the individual. In the context of the individual, memory artifacts have been discussed as visible, physical manifestations of identity and self [75]; physical mnemonics that provide a narrative for the individual through their associations [83]; and ties to past relationships, including treasured relationships with loved ones that may have passed [88]. At the intersection of human-computer interaction and aging, manifestations of memory were noted as “key in the development and maintenance of the sense of self, particularly in old age” [90, p.149].

It is important to note that memory artifacts are not passive but shape memory itself—they can be constructive or reconstructive for the individual [106]. Per Schwarz, “Material objects are indispensable for many ways of representing and re-presenting the past, as people bring the past to the present by engaging with its material representations” [92]. For instance, a photograph of a

family on a beach shows not just place (beach) and people (family) but, for those with attendant ties, memories of a moment—the feeling of sand, the words once said, the emotions felt, the ties that bind. As the prefix “re-” suggests in reconstructive and representing, the meaning(s) of a memory artifact change again and again as one looks back. Work in HCI has reflected this consideration (e.g., [46, 59]). For instance, Pinter et al. investigated the way “algorithmically curated content” became confrontational after a breakup—computations correctly inferred connection between individuals without realizing the complexity of their history and the way time can shape meaning for the individual [81]. As such, Pinter says, systems can “oversimplify the complexity of people’s social contexts” [81, p.1].

Value to family. Beyond the self, curation of memory artifacts takes center stage in a greater project of organizing, divesting, and preserving memories, histories, and symbolic meaning for families [106]. They can be, in essence, vessels of family history, objects that create a stable family identity [64, 103]. From a curator’s perspective, deciding which artifacts to retain and which to divest within the family context is an indexical project, situating people, events, and places into a narrative—a mnemonic of family history that has symbolic and psychological value to all individuals within the family [23, 36]. This work is often done by a designated steward-curator but is also a collaborative project, as noted by Morgan, “Part of what family living means is the sharing, not necessarily harmoniously or consensually, of memories” [65, p.144].

In HCI, researchers such as Jones have investigated family memory, in contexts such as inherited family artifacts [47] or the documentation of new childhood memories [49]. In these works and more, memory and memory artifacts are negotiated by different generations, sometimes built on the presumptions of what past loved ones intended [48] or what their children might want into the future [49]. We can also see this in the work of Petrelli, as in an investigation of the macro- and micro-rituals of a holiday like Christmas and how these traditions are predicated on affective familial acts built over time [76].

Value to the community. Individual memory is tied to collective memory, a social, shared body of remembrances: “Every individual memory constitutes itself in communication with others” [2, p.127]. Groups have their own collective memories, unified by a corpus of artifacts [109]. In this way, a neighborhood can have its own collective memory unified by remembrances and artifacts of past bodegas, parades, and colorful characters, or a nation can have its own collective memory unified by momentous occasions and monuments of stone. Thus, memory artifacts in the community context can have an organizing presence that preserves that which is unique and unifying about a group [73].

In human-computer interaction and related fields, research often examines ways to facilitate community remembering of memory artifacts through design. For instance, work has investigated ways of “supporting and mediating cultural heritage practices,” such as building a digital community around a razed physical community in the case of the Cassiar community initiative [21, p.1]. Elsewhere, an affective feeling of “responsibility” compelled Chinese streamers to preserve their Intangible Cultural Heritage digitally and communities on Bengali Quora negotiated the collective decolonization of identity [24, 62]. In research on digital remains and “communicative traces” after death, communities form around memory artifacts [33, 54]. Brubaker and Hayes looked into post-mortem MySpace comments and found the space to be contested, “appropriated by (...) diverse groups of survivors with disparate needs” that evolved over time [15, p.131]. In these cases, sociotechnical systems informed the collection and recontextualization of memory artifacts for a community at large.

Older adults, memory artifacts, and curation. As memory artifacts are materially, emotionally, and symbolically valuable to the individual [79], the choice to preserve or divest is a difficult one. In aging research, older adults frequently make difficult choices regarding the preservation of and divestment from objects in a number of scenarios. For instance, moving to a new space requires preservation and divestment. These moves can be a personal or collective choice, but older adults may face downsizing while moving into a smaller home, shared home, or assisted living facility [44]. When downsizing does occur, “the prospect or reality of loss of home (...) means moving into a place bereft of the meaningful objects that surround one in the home” [95]. This breakdown of the symbolic bond between individual and their objects can lead to depression, anxiety, and unneeded stress—especially following a forced move or divestment [7, 18]. As Csikszentmihalyi and Halton wrote, “depriving an older person of such objects might involve the destruction of his or her self” [22, p.102].

Even if a move is not imminent, a process of personal divestment and potential preservation is often in motion as older adults attempt to find worthy recipients for treasured objects [83]. In this case, a personal divestment from an artifact could ultimately preserve the artifact in a different space, as when an older adult gifts a meaningful artifact to a relative [51]. These acts of divestment/preservation can occur in individual moments of gift-giving or at larger scales, as can be found in estate planning. This divestment process can be complex and rife with meaning and challenge, as when no worthy recipients present themselves—encapsulated in the statement: “It should mean as much to them as it means to me” [83]. In doing so, older adults act as conservators who use their lifelong expertise in family history to act as custodians of family legacy.

Taking all the above into account, the question of how older adults curate memory artifacts (and thus, pass on legacy and memory) is a significant one. As memory artifacts are valued differently by different groups, we are interested in the groups for which curation work is done and how these groups affect curation decisions by older adults. Additionally, as noted by Vitale et al., curation work is “under-explored” territory within human-computer interaction and, as such, we wish to further an understanding of curation work from the perspective of older adults [107].

2.2 Memory Artifacts, Materiality and Embodied Practice

Materiality. Past work in human-computer interaction spaces has investigated the materiality of memory artifacts as a distinct area of inquiry. In physical spaces, the materials, composition, texture, feedback, and affordances influence a user’s experience and interaction. In digital spaces, technologies can inform experiences that have material presence or sensorial influence. For HCI, these spaces often inform and influence one another, with physical artifacts being enhanced with digital technologies and digital artifacts being informed by their physical counterparts. For instance, Olly, a digital music reminiscence player, was presented to users with a rich veneer wood grain—an aesthetic choice that informed reflections on temporality through its material presence [70].

Elsewhere, the physical and digital meet in the multi-material melange of Odom et al.’s Photobox, which revisits digital photos and memories through the randomized printing of physical keepsakes [71]. Dong, Ackerman, and Newman conceptualize technologies to capture digitally a home’s traces of history and memory left behind by previous homeowners [29]. Further work in human-computer interaction contributes digital design implications by investigating current practices within the home (e.g., [46, 53, 110]) and lifelogging systems are considered for their potential for future reminiscence (e.g., [111]). In these and other works [37, 55, 84, 113], the materiality of an artifact plays a role in its affordances and meaning.

In our research, we present scanning in memory artifacts as an everyday act and the scanner as a technology to support memory artifacts. Scanning, or digitization, is, in this context, the process of material transition from physical to digital space. Retail corporations like CVS and Walmart

attend to these digitization needs in-store, with the ability to drop off photos in exchange for digital photos on CD, USB, or cloud storage. Digitization companies like Legacybox allow individuals to digitize their old media by sending in boxes of media to be scanned professionally. Per Legacybox marketing materials, “Don’t wait until it’s too late - save your irreplaceable memories from being lost forever when you digitize with Legacybox” [56]. Organizations that cater to older adults, including AARP, provide how-to guides to the digitization process, with one such how-to article featuring the opening salvo:

Chances are you’ve thought about bringing your old paper photos into the digital age. Great idea. After all, you likely have a lifetime of precious memories trapped in photo albums, shoeboxes or dusty frames. Once digitized, these photographs will no longer fade over time... [89]

This change in medium “shapes the ways in which archival sources will be preserved” and, as such, cannot be overlooked [86, p.2293]. Research has also investigated if the shift from one medium to another changes preservation [72] or interaction with an artifact. For instance, in CSCW research concerning heirlooms and older adults, digital counterparts are often felt by participants to be less significant for reminiscence and family history [53, 69, 78]. This loss of significance could be informed by Hayles, who says that a change in the materiality of a signifier can change what is being signified. In this way, “new technologies embody new models of signification” and the translation of originally physical objects into digital space can create symbolic drift [41]. However, despite these findings, digital technologies allow for the possibility of multi-modal and multi-material affordances and additional features to better inform the value and persistence of memory artifacts. Our findings and discussion interrogate this productive tension between the physical and digital.

Embodied practice. Contemporary research also illuminates the practice of scanning artifacts as an embodied practice. For instance, Ringel and Ribak’s ethnography on scanning at the National Library of Israel discusses “the human labor invested in digitization, the mediation involved in the production of digital objects, and the poetics of scanning machines” and is particularly relevant [86, p.2293]. With the act of archival work being “fluid, evolving, and socially constructed” [114, p.2], rendering analog archives into a new digital space is a technical, material, symbolic, and emotional process. In this work, various breakdowns occur: for instance, a torn photo presents a challenge in scanning. Do the torn parts remain separate in digitization? Does one scan the parts as a whole, rendering the two pieces one in digital perpetuity? Differently, Plantin suggests scanning is an invisible labor that mirrors industrial labor during large-scale archival data processing projects [82]. In these large-scale efforts, the invisibilizing of work is prevalent, and individuals enacting the labor of scanning perform everyday resistance—for instance, in taking the time to engage emotionally with the works processed. Our work extends the idea of scanning as an embodied and affective labor, one that is fluid and supports emotional engagement with the memory artifacts being scanned. However, there is an insufficient understanding of the embodied and affective nature of this work in the context of the everyday—our empirical investigation of older adults’ experiences with curation hopes to inform future work in this area [74].

3 METHODS

This research project conducted a mixed-methods study to gather conversational data and an embodied experience with memory artifacts. We began our research with an initial screening survey as a recruitment tool, followed by a semi-structured interview, a cultural probe that engaged participants in a hands-on exercise, and a final exit semi-structured interview. This mixed-methods approach provided us with multiple opportunities to interrogate our research questions and present

a richer understanding of the relationships and tensions between older adults and their personal artifacts. We discuss the methods employed in detail below.

3.1 Participant Recruitment

First, we recruited participants that met the following criteria: aged 65 years or above, residing in a mid-sized city¹ in the U.S. to facilitate travel to and from their places of residence, and participation in one survey, two semi-structured interviews (each taking place either in person, over the phone or videotelephony), and one cultural probe session taking place in person, with masks and appropriate precautions. We recruited participants in two ways based on purposive sampling. We conducted in-person recruitment via physical flyers at community locations, such as libraries, restaurants, and the local community center, and online recruitment via areas with a high volume of community presence, such as NextDoor, where we prioritized local neighborhoods with high activity.² This online/offline recruitment method recruited a varied population not necessarily from one source (like one sociotechnical system) and allowed for participation by individuals who were not invested in online forms of communication.

Potential participants were first required to complete a survey. Overall, 52 potential participants completed the survey, with 16 participants taking part in the full research project. We designed this survey to collect demographic data and to confirm potential participants met the above criteria. In addition to demographic data questions, the survey contained 11 questions related to the use of digital technologies and the importance of memory artifacts. These 11 questions were asked to gain initial quantitative measures on attitudes towards technology and the preservation of memory artifacts. The survey results for our 16 participants are featured in Appendix A. Overall, our 16 participants were either somewhat (62.6%) or extremely (31.3%) comfortable around technology and already use digital technologies to communicate with family and friends, search and retrieve information, and store information and documents. Additionally, participants found “personal possessions” to be either moderately (31.3%), very (37.4%), or extremely (31.3%) important, with almost all participants suggesting parting with possessions would either be somewhat (56.3%) or extremely (31.3%) difficult. Finally, the screening survey came with a free-text space that read: “This study concerns personal memory. Please list objects/systems you own/use that hold personal memories for you. These can be physical or digital.” The results of the free-text responses are featured in Appendix B. The responses have been unaltered and frequently feature situating information (“gift from mom”), affective description (“photograph of my parents at the time of their engagement”), and physical and digital artifacts side-by-side (“Facebook, my daughter’s photo album”). Some of the free-text response artifacts were discussed in further sessions with participants.

We called these 52 potential participants to schedule an initial interview, of which 16 participants responded that they were willing and able to participate. Participants were compensated for their time on a rolling basis. Each participant received \$30 for the initial survey and semi-structured interview session, \$30 for the cultural probe session, and \$30 for the exit semi-structured interview. In this way, participants who did not complete each stage would receive payment for those stages that they did complete. However, all participants completed the three segments of the research project. Our university’s Institutional Review Board (IRB) approved this study.

¹A city with a population less than 250,000 and greater than or equal to 100,000 [35].

²NextDoor is a social networking service that focuses on hyperlocal communication between members of the same neighborhood. Out of the applications YouTube, Facebook, Instagram, Pinterest, LinkedIn, Snapchat, Twitter, WhatsApp, TikTok, Reddit, and Nextdoor, Nextdoor is the only application to have a higher percentage of 65+ users to 18-29 users [6].

Name	Gender	Race/Ethnicity	Age	Lives With
Mary	Female	White	72	Partner
Linda	Female	White	68	Partner
William	Male	White	77	Partner
Pamela	Female	Black	66	Alone
Carol	Female	White	74	Partner
Patricia	Female	White	74	Partner & Daughter
Linda	Female	White	76	Alone
Michael	Male	White	71	Alone
Sandra	Female	White	79	Alone
Richard	Male	White	72	Partner
Nancy	Female	White	71	Partner
Maria	Female	White	70	Alone
Barbara	Female	White	70	Partner
Sharon	Female	White	75	Alone
Debra	Female	White	68	Alone
Shirley	Female	White	85	Alone

Table 1. Participant Summary

3.2 Initial Semi-structured Interview

As noted above, 16 participants responded to our call and scheduled an initial semi-structured interview (see Table 1).³ These interviews took place during the summer of 2022. The first author conducted the initial and subsequent encounters in a location of the participant’s choosing—in person, over the phone, or via video conference platforms (i.e., Zoom or Google Meet). Interviews lasted between 28 and 82 minutes and were, on average, 45 minutes long. The first author conducted the initial interview to explain the study further, chat with the participants, answer questions, and understand participants’ relationships with the artifacts in their homes and their present curation practices. The first author kept notes during the initial interviews to identify early patterns that influenced updates to the interview protocol. All interviews were audio-recorded, for which we received oral consent from participants at the beginning of the study.

3.3 Cultural Probe

At the end of each interview, the first author scheduled a follow-up cultural probe session. The cultural probe is a method to gain insight into situated practices, values, and contexts through open-ended tasks within a natural environment. Due to a cultural probe session’s open-ended and in situ nature, it can capture rich personal or tacit information that might be uncovered in interview sessions [34]. Per Hall and Ellis, the materiality of the meaningful artifact can significantly affect memory and participant response [40]. Additionally, cultural probe methods can lead to empirical evidence that guides complex design considerations and supports user-centered technologies [108].

The first author conducted the cultural probe sessions in person in a location of the participant’s choosing. Participants chose to host the first author in their homes or meet in a library meeting room. The first author undertook COVID-19 precautions and wore a mask during cultural probe sessions. These sessions lasted between 42 and 104 minutes and were, on average, 59 minutes long. During these sessions, participants presented memory artifacts to the first author. The participants decided

³All names throughout the paper were randomly selected from a list of the top 25 U.S. baby names from each participant’s birth year.

which memory artifacts to bring to the sessions and which artifacts to discuss in whichever order they preferred. In some cases, the participants had set aside a collection of letters or photographs to discuss. In other cases, the participants would take the first author around their home, pointing out artifacts as they saw fit. This process employed a think-aloud protocol, and as such, the first author asked participants to say whatever came to mind as they held their artifacts. This often included what they were feeling, the memories attached to the artifact, or comments on the materiality of the artifact. When there were lulls in thinking aloud, the first author asked participants about each memory artifact. These questions included: where the image was taken (if a photograph), who sent the letter (if a letter), the artifact's personal value, and what memories the artifact holds for the participant.

After discussing each artifact, we digitally scanned each memory artifact. In this process, we utilized a Magic Wand Portable Scanner for multidirectional paper-based scanning.⁴ The first author placed initial scans on an SD card (per scanner utility) that were then transferred to the participant's preferred digital storage method. The scanning session provided information regarding the embodied experience of remembering, the act of digitization as a human-computer interaction, and the potential tensions between physical and digital mediums. In between the cultural probe session and the final interview, participants were asked to do whatever they saw fit with the digital versions of their memory artifacts. Overall, the cultural probe sessions provided vital experiences with memory artifacts and explored participants' attitudes and perceptions regarding personal curation and the role of technology in these practices [52].

3.4 Final Semi-structured Interview

After the workshop, we scheduled a final interview with each participant. These interviews were scheduled 2-3 weeks after the cultural probe to allow participants time to live with their digitized artifacts from the cultural probe session. As with the previous encounters, the first author conducted interviews in a location of the participant's choice—in this case, participants chose to conduct interviews in person or over the phone. We conducted this final interview to provide participants a chance to give their feedback on the cultural probe session, the value of their scanned artifacts, how digitization can inform personal curation practices, and how a digital transition can support or complicate memory artifacts.

3.5 Analysis

We recorded the semi-structured interviews and cultural probe sessions and transcribed these audio recordings via Otter.ai. Following Nowell et al. and their call for more rigorous and methodically thematic analysis [67], we first familiarized ourselves with the data—reading through the semi-structured interview data and memoing, summarizing sections of the interviews (e.g., “I’ve given myself permission to part with it, I hope that it will become part of those people’s lives” was summarized as “she hopes objects divested from will become part of others’ lives”.) After finishing a round of memoing and summarizing on initial semi-structured interviews, we utilized inductive thematic analysis [11]. Through this analysis, we generated initial codes, documenting our process. This inductive analysis allowed us to identify patterns throughout the transcripts without utilizing an existing framework. With these patterns and codes, we collected our codes under themes—Time (e.g., “Forgetting”, “Recalled memory”), Artifacts (e.g., “Heirloom Artifact”, “Digital Artifact”), Emotions, Digitization (e.g., “Connections”, “Memory Lost”), Curation (e.g., “Deferral”, “Labor”,

⁴The Magic Wand Portable Scanner was used for its convenience in multidirectional scanning, so, for instance, objects in frames or photo albums could be scanned without being removed. Additionally, this scanner was available for check-out at the nearest local library to ensure participants could continue digitization post-research without incurring financial burden or having to learn a new tool. Post-research, three participants did check out a portable scanner from the library.

"Emotional"), and Other (e.g., "Community History", "Death"). We then reviewed these themes and their respective codes by returning to the raw data and checking for accuracy. These themes focused the work, highlighting the frequency and significance of certain concepts, including artifacts' material and symbolic value, the emotional burden of legacy and divestment, strategies for overcoming this burden, and the value of digitization. After an initial draft was written, a process of informal member checking was enacted: we sent the paper to each of our participants to see what they thought of the draft; to make sure they were not misquoted and that all identifying information was removed; and that their curatorial efforts and memory artifacts were not misrepresented [12]. Ten of our participants responded. Some of their feedback was incorporated, related to clarifications of theoretical concepts like temporality and suggestions on the further unpacking of some themes.⁵

4 FINDINGS

The findings are structured as follows: in section 4.1, we first describe in detail the personal curation practices of participants as being done for oneself, the family, and the community and how each practice presents different considerations for memory artifacts. In section 4.2., we then show how time influences participants' feelings towards memory artifacts and how time affects personal curation practices, as health, memory, and memory artifacts all tend towards decline over time. After that, in section 4.3, we unpack participants' practices of scanning memory artifacts and how digitization can inform personal curation. In section 4.4, we highlight how participants do and do not preserve the context, meaning, and memories held within their memory artifacts and how these actions present challenges for future generation's understanding of the memory artifacts themselves.



Fig. 1. One of Debra's memory artifacts

4.1 Personal Curation as Practice

As stated above, personal curation in this context is any curatorial practice done by the individual with their artifacts. These practices include selection, organization, contextualization, divestment, or preservation. For participants, personal curation was an everyday undertaking that represents

⁵For instance, Carol noted that "partial memory may actually be richer than complete memory because the empty spots give us room to fill in what we hoped [for]"—a concept that informed some further reading into the value of forgetting and partial remembrance.

and situates one's life and memories in time, place, and relation. Participants referred to this process as legacy building, narrative creation, or memory keeping. Curatorial practices were diverse among participants, and one can consider each collection as a reflection of its owner. In this section, we describe three forms of personal curation—personal curation work for oneself, personal curation work for family, and personal curation work for community. Each of these forms of curation had unique emotional qualities, activities, and considerations. We expand these ideas below to form a taxonomy of personal curation.

4.1.1 Personal Curation Work for Oneself. As Linda stated, "If you've kept [an artifact], you've kept it for a reason". Often, these reasons stemmed from personal remembrance and emotions. When Michael discussed the impossibility of throwing out letters from past romantic partners, he voiced his undefined sense that the letters "have some value to me, but I couldn't really describe it." Participants often described *the feeling* that individuals from the past are in some ways present through memory artifacts. For instance, Barbara said she "feel[s] the presence of the other readers" in old books, Linda felt her mother's presence when holding a note in her mother's signature green ink, and Pamela felt her ancestors and their hardships in her photo albums.

These qualities made organization, preservation, and divestment affective or emotive judgments when curating for oneself. Treasured memory artifacts would be at hand or displayed, while memory artifacts of little personal value were relegated to boxes or thrown out. Additionally, artifacts connected to negative emotions were also placed in boxes or thrown out, as, per Nancy, "You don't hang on to things you don't want to remember." In sum, participants described their curation practices as predicated on affective response—generally, if the memory artifact made them feel something, it would be kept; if the memory artifact made them feel little to nothing (or, alternatively, something tragic), it would be thrown out.

Curating for oneself frequently entailed turning the home into a bespoke exhibition of memory artifacts, a space for tacit remembrance. On a tour of Pamela's home, each room had a curated collection of family heirlooms, each with a story. During the tour, Pamela stated, "I guess I'm starting to sound like some typical old lady with [all these] memories but that's all I got. (...) I have to have a place to calm my mind." Here, memory artifacts were curated in the home to present an environment to escape to. These memory artifacts were displayed by participants so they were "surrounded by things that reflect our stories" (Nancy). This feeling was mirrored by Sandra, who said having personal artifacts hung on her wall gives her a feeling that "comes and goes immediately":

There's something that is in my brain and my heart, for a second, I remember and then I go onto whatever else I was doing—I don't dwell on it but I do remember (...) it just touches me so much when I see some of these pictures. (...) There's a lot of our history that's woven into a lot of these objects.

In these instances, curation work for oneself is often about presentation and display for everyday remembrance and emotion. Some participants took this further by frequently changing their memory artifacts, as though the home was a temporary museum space for certain memories. When memory artifacts became too familiar, they were exchanged. Per Debra,

What I do is I treat myself like a toddler—you know how parents rotate their kids' toys? So that when they pull out a toy they haven't played with for a while, they're all interested in it again. So I do that for myself. (...) I go to the storage locker and get something out and switch it around.

For Debra, curation's intended effect is an affective response within herself. When the artifacts do not produce that effect any longer, they should be replaced with artifacts that do. Those previously

displayed artifacts are then preserved in a storage locker, hidden away until they can spark responses anew.

4.1.2 Personal Curation Work for Family. The introduction of one's family alters the values, practices, and considerations of personal curation. The emotional and affective qualities of memory artifacts that were so important in personal curation for oneself now have to be considered from the perspective of another. Additionally, curation work done for oneself was often done *in the present for the present*. In other words, participants organized and displayed certain memory artifacts to suit their present interests. Curation work done for family is often done *in the present for the future*. Preservation, divestment, and organization were undertaken for family acquisition in the event of downsizing or death. As such, personal curation becomes more about legacy and leaving something meaningful behind.

In her personal curation work for family, Patricia has considered her memory artifacts from an imagined family perspective, hoping that her family might cultivate their relationship with her artifacts in the future. She hoped her family “may add something more to them and that’s okay. Because that means that they’re interested in what it is and they’re looking at it, they’re not ignoring it but seeing it from their vision and through their life experiences.” As one can see, the introduction of family made participants reconsider their memory artifacts from an outside perspective. Sometimes this practice led to moments of tension. By way of example, Maria discussed her divestment of personally meaningful photographs in terms of family,

I’ve gotten rid of many pictures, thinking, who would want to look at these again—my kids aren’t interested in pictures of my aunts, uncles, friends (...) While I may know them, my children don’t know them. So those are some of the pictures I threw away because I think, you know, who cares about these? Who will ever look at these pictures?

In this example, we can see a strategic gambit most participants described. Maria’s divestment was predicated on assumptions of her family’s value judgments. Participants worried about whether the meaningfulness of memory artifacts could be understood or translated to their family members. For instance, Michael described a painting on his wall with multiple layers of meaning: the painting was of a meeting house in Vermont, where he had once been. He won the painting twenty years ago in a raffle with his girlfriend and friends. More recently, one of his friends passed away—since then, “the picture has quite a different sort of meaning to me.” At once, the painting was described as being “beautiful” as an object, holding positive memories of past relationships, and tragic memories of a recent passing. However, these layers of meaning have not been described to his family, “I’ve said that this is the painting of the meeting house and where I got [the painting], but I guess I haven’t translated or provided the other kinds of context when talking about it.” As such, while the painting was meaningful to him (“I wouldn’t want to give that up until I’m dead”), Michael worried it would be thrown away by his family, who might not realize its significance.

These assumptions of a family’s value judgments required participants to consider how much of their personal memories should be revealed to their families to contextualize memory artifacts—or if such contextualization would matter at all. Some participants, like Patricia, had family members interested in their memory artifacts, which made sharing memories and artifacts easy. During our visit, Patricia and her daughter each added their own recollections and corrected one another on the names of individuals in photographs and dates of family events. Other participants had disinterested families and this lack of interest challenged the act of personal curation. Participants wondered if their families would keep anything, a feeling summarized by Mary,

It's just... [I say] 'I'll save this for you' and they'll say, 'No thank you' (...) I think it's gonna be a Hell of a sale. (...) You wonder, 'Are they going to keep this? Or are they going to sell it at a tag sale for \$3?'

Here, Mary mentioned a frequently cited logical end to memory artifacts—the yard sale. Participants often marked certain memory artifacts as destined for an eventual yard sale, estate sale, fire pit, or garbage dump. The feeling that present-day personal curation was being done in vain had an impact on participants like Debra, who felt challenged on how to proceed,

I already know that the future is not going to be my children wanting any of this. That's been made clear to me, which is kind of sad, but I get it (...) they have no value towards them whatsoever. (...) My parents lived during the Great Depression. So everything was so precious and so valued. And so I think I picked up on that. (...) My generation seemed to be the kids that knew what we were going to inherit from our parents and took that very seriously, where now my daughter said, 'Maybe I want the gold candy dish'. And then later on, she said, 'Yeah, I really don't even want that.'

For Debra and other participants, the lack of interest from family members led to a disinterest in personal curation for family and, thus, a disinterest in legacy-building or leaving something meaningful behind. Nancy discussed this apathy in personal curation for family in contrast to her interest in personal curation for herself,

My children will have to do it, they can look at all those albums and throw them out. It's completely up to them, I will not be here so it won't matter. But for now, those photo albums are what keeps me grounded to my past and keeps me grounded to people that were there at different times in my life. And when my memory fails me, I can go back to the pictures and say, That's what was going on.

Here, the photo album is both a site of interest and disinterest: Nancy has an emotional response to her albums that serves a purpose in storing and retaining memory, whereas her family does not.

However, these acts of personal curation for family are always done in the present, based on *present assumptions of future value*. Nancy discussed the quintessential example: children's crafts from school. After saving most of her children's school paintings for thirty years "thinking one day my kids might want to see it, well guess what? They don't want to see it and they don't care." In throwing these artifacts away, Nancy realized, "you change over time as to what's important to you or you appreciate that the people you were saving things for, they've grown and [changed] too". In this way, it is often difficult to know what will be important into the future. What is essential to a person is constantly changing, and by participants' admissions, memory artifacts that meant little to them in the past have aged into meaning and value. This was the case with Mary's husband, who found that unremarkable trinkets from his mother were imbued with new meaning and significance after her passing. Examples like this immobilized some participants from divesting, for fear of an object's potential future importance. Per Linda, "It's hard to know what to keep and what not to keep, you know what I mean?"

4.1.3 Personal Curation Work for Community. Beyond the family, participants considered their memory artifacts as being potentially meaningful to larger communities. Personal curation work for community altered the practices of participants. This form of curatorial work was often aspirational and ill-defined, something that should be done at some future time.

Personal curation work for community was most often considered by participants who did not have family members who had taken an interest in their memory artifacts or participants who did not have family at all. For instance, Debra, who had struggled to find an interested party in her family, considered contacting local community history museums or libraries to see if they were

interested in some of her father's photographs. He was a scientific advisor appointed by Richard Nixon and she considered his photographs to be of elevated importance—something beyond the sole interest of one family. Pamela also wished to donate portions of her family's photographs and ephemera to a museum. For Pamela, these documents of early 20th-century black life in the Midwest portrayed a historically significant look into everyday black life that current museum practices had not captured. Finally, when discussing his collection of technology artifacts ("one of these is in the MoMA!"), Richard stated, "I don't have that many friends. And I have no family left. This is worth something to somebody. So, I need to find that somebody."

In sum, participants felt that their memory artifacts were meaningful to someone somewhere. However, participants had not yet contacted centers for community preservation—personal curation work for community often consisted of preservation in the present for a potential, yet deferred, future on display or in an archive.

4.2 Time Shapes the Memory Assemblage

In experiencing memory artifacts with participants, *time* was both a situating element and a force. Often, time was called upon to situate the participant and listener within a particular moment ("this would have been '90... '91... maybe '92"). Time was a detail that expands the story while sharpening its focus. In another way, time was an *entropic force within the memory assemblage*, a unique mediator within the assemblage that tends towards disorder. This section investigates how time acts upon individuals and their memory artifacts and how time alters remembrance and personal curation. These investigations cumulatively present the precarity of memories, memory artifacts, and history over time.

4.2.1 The Depreciation of Health, Memory and Artifacts Through Time. Time has numerous relational effects on the memory assemblage. Participants discussed these effects in the context of their physical health, their memories, and their memory artifacts. As expanded upon below, these effects are often discussed as tending toward decline or disorder.

The Individual's Memory. Memories accumulate over a lifetime and one constructs and reconstructs memories each time they are remembered. Carol questioned the value of "true" memories over constructed memories when discussing her father's failing memory: "Is memory in and of itself critical, or is memory what it serves you in the moment?" For participants, memory could change in value and in meaning over time, serving different purposes in different moments. However, time's effect on memory was discussed most often in the context of forgetting. Participants struggled to recall some key details of their personal memory artifacts. For instance, Shirley struggled to remember the details of a photograph she had chosen to discuss. After turning the photograph over in her hands and trying to recall the photograph's location, she said flatly, "You should have talked to me two years ago when I still had a brain." Similarly, Carol discussed the difficulty of remembering over time. For Carol, memory was "elusive—it's useful to you while you have it. And once it's gone, it's gone." Throughout the cultural probe sessions, participants made similar statements, often when stories escaped them. In these instances, the absence of the memory was felt strongly by the participants—the memory that was once available for recall was no longer available.

The Individual's Physical Health. Inevitably, discussions of the past lead to discussions of the present and future, often in comparative terms. One point of comparison was health—when looking at memory artifacts, changes in health were brought to the foreground. Participants discussed their health as subject to change over time, frequently in decline or in the process of recovery. For instance, Maria discussed her health in relation to photographs of her home, comparing its past

state to its present state, with additional renovations to make the home “aging-in-place friendly” as she had recently found it hard to get up and down steps. In another example, Richard compared his present health to his past health when looking at an 8x10 photograph of himself mid-marathon. Looking at the memory artifact, he recounts the race and its difficulties before marveling that he could ever participate in such an event at all. Presently, he waits for knee replacement surgery and hopes to recover enough to make the precarious trip up the attic stairs, where boxes of photographs and other ephemera wait to be uncovered. As he waits, the photograph serves as a document and a point of comparison in changes to his health.

The Memory Artifacts. Beyond the individual, physical artifacts too reflect the effects of time. Participants mentioned how moments in their life course irreparably damaged artifacts. Water damage from storing artifacts under a sink or in a basement was frequently cited as the reason for the loss of artifacts. Improper preservation over time also led to the physical decline of memory artifacts. For instance, Linda had memory artifacts damaged by storage on red crêpe paper, which bled into the fibers of the objects. In a more stark example, Pamela wanted to scan the only remaining photo of her great-aunt during our session. She found her chosen storage method had caused the photograph to adhere to a transparent plastic sheet, distorting and tearing the face off the print. In our discussion, Pamela said her memory artifacts are “fuel to keep me going” and later lamented that some pieces in her collection were “wearing out, getting old, changing, aging... some of those pictures I showed you really got bad.” In this instance, the photograph’s meaning and value as a memory artifact of a loved one and a document of her life and image were lost to time. Patricia summarized these issues as she discussed older memory artifacts, “You could see that if they weren’t properly taken care of, they would just be sand... from dust to dust...”

In Sum. The body, mind, and memory artifacts have a similar trajectory. Taken together, these changes in body, mind, and artifact influence how participants considered memory and the act of curation. Present health and artifact conditions compelled participants to consider legacy and personal curation “before it’s too late”. Per Patricia, “we’ve got to figure out how to make our legacy, because when we die, who’s going to do it?” Additionally, personal curation can support both health and artifact. By way of example, Nancy discussed her personal curation as an individual practice in the context of changes in memory. She stated,

I’m very mindful of the fact that my memory is not the same as it was when I was younger. And so there is some merit to hanging onto things and saying, Oh yeah, now I can remember that.

Here, Nancy highlighted the importance of memory artifacts as supplementary to a self-diagnosed declining memory. Nancy was in the process of going through her photo albums, reorganizing them and getting rid of certain photos to create, in her words, a “legacy” with compelling artifacts—“compelling” as defined in the present, as per Nancy, “what feels right to me today may not be the [same tomorrow].” In the next section, we investigate curation’s multiple temporalities.

4.2.2 Memory and Curation’s Multiple Temporalities. While life is lived linearly across time (with Monday becoming Tuesday and Tuesday becoming Wednesday), the same is not true for memory. Memory is affective and reactionary as one memory begets another and stories turn into further stories, across multiple lines of time. For instance, Debra discussed her most important memory artifacts—her mother’s miniature stuffed bears. When Debra discussed the bears, memories from multiple times mixed together and built on top of one another,

These little bears are so precious to me... My mother and father were nature lovers; they took these little bears, posed them in nature scenes outside, took photographs of them, and made stories about them. They were the only toy that my mother had

during the Great Depression. I have also posed these bears for photographs and got interested in photography... I was able to give two of the little bears to a grandson, and he actually went out with me, and we took pictures of Mr. Bear's experience on a trip that we took together. We'd pose Mr. Bear at the different places that we visited. So the bears are really, really important to me.

Here, years and generations collapse into something both inside and outside of chronological time. As memory is a process of sporadic remembering and forgetting and certain details are more significant in the participant's life, certain moments and artifacts become central to a cluster of memories, the beginning of a unique collection of time.

These unique collections of time can be solidified in personal curatorial practice, as physical manifestations of nonlinear thinking and multiple temporalities. For instance, Linda has a subscription to her hometown newspaper, which is delivered weekly. In the newspaper, she looks at the obituaries. If one of her old classmates happens to be among the deceased, she cuts out the short notice and tapes it into her yearbook, under the individual's senior photograph. In this way, the yearbook becomes a document of adult lives beginning and ending with the notices' text filling the in-between, a collapsing of time in which each senior photograph becomes its own life course. Elsewhere, Carol transcribed hundreds of letters her parents wrote to one another while they were distanced in the late 1930s. She then created an over two-hundred-page book of these letters, each transcribed and annotated. These annotations are digressional notes that combine photographs from different periods, asides about their relationship from beginning to end, present-day observations, and explanations of cultural references. In this way, one annotation can unite multiple strands of time connected by an idea, a person, or a photograph. Carol also created CDs with all the songs mentioned in the letters, to be listened to while reading.

The examples of nonlinear thinking become more abstract when participants discuss their heirloom artifacts. While they attribute personal memories to them as well (growing up with a relative's good china, seeing artifacts in a grandparents' home, hearing a grandfather clock), the memory artifacts' initial memories are not remembered but often imagined. Per Sharon, "It's so interesting because it's really not even the memories behind it because we weren't around at the time. It's building some new memories or building onto old memories, making them more complex and interesting." For Sharon, confronting heirloom objects becomes an exercise in imaginative thinking, combining what little historical memories have been passed down with her own memories and filling in that which was missing.

In these examples and more, chronological time is disposed of—after all, as William said, "There's so many parts to my life (...) you can't tell your whole life year by year." Instead, collections are curated in disparate ways to create impressions with distinct temporalities that expand, contract, and confound linear time.

4.2.3 Inertia of Memory Artifacts Through Time. Over time, key information is lost and deliberate or unintentional forgetting occurs. These instances of forgetting accumulate over time, leaving major gaps in the significance of the memory artifacts that remain. As such, artifacts wrestle with the inertia of previous generations of personal curation—or lack thereof. For instance, Maria discussed the twenty-nine photo albums she acquired after her parents' passing, "many of them are from when [my parents] were dating or [they're] of people I didn't know. My mother had a funny way of labeling things, she would write 'Port Huron' but she wouldn't say who the people are or what was going on or when it was—so I got rid of a lot of pictures." These unintended mysteries limited emotional impact or connection with memory artifacts, frequently leading to their divestment. If memory artifacts are predicated on memory, what is their value when the memory is gone?

Participants often felt these mysteries as personal failings, as memory keepers looking back on their carelessness. Participants wished they had cared, listened, and preserved before it had been too late. For instance, Barbara pointed to an oil painting “of an early ancestress whose story I don’t know much about. And unfortunately, I was too stupid to ask my mother before she died.” Sharon had recently discussed a similar failing with her sister when going through photographs,

It’s just very emotional, because, of course, you never knew your parents when they were two teenagers. Some of their adventures in life, you just didn’t know about. Or when you’re young, you didn’t care enough to listen... I had an aunt who used to drone on and we just couldn’t even listen to her—“no, make her stop!” So my sister and I were recently laughing... “Don’t you wish that we had listened to Aunt Margaret just a little bit more?” (...) And of course, probably now that we’re old, younger people are [listening], going, Oh my God, would they just shut up!

Sharon recounts her previous disinterest in stories she wishes she had retained while noting the cyclicity of unintentional forgetting—the same disinterest will cause the loss of her stories over time. In thinking with her oil painting, Barbara has a similar regret when she stated succinctly, “now I think to myself, Gosh, why didn’t I listen? Because we don’t know to listen. (...) My attitude definitely has changed. I wish that I had been more careful... some of those things are gone now.” These instances of forgetting complicate the preservation of memory artifacts and, over time, memory artifacts become solely artifacts separated from memory. Previous research and conventional wisdom suggest digital technologies can “still” time—memory artifacts can be captured and retained in their present state. The next section complicates this understanding while investigating hands-on scanning and its value to the study’s participants.

4.3 Scanning as Personal Curation Practice

We used an embodied, hands-on approach to scanning personal artifacts with participants to investigate the importance of digital preservation of memory artifacts. Several participants had already begun digitizing memory artifacts independently (per Sandra, “when your inquiry came, all I thought was, Holy smokes, he’s probably going to be very interested in what I’m doing right now”). In contrast, others had never considered doing so or did not have the technology to do so. In the following section, we investigate the importance of the physical artifact, the good and bad of digital artifacts, and the practice of scanning.

4.3.1 The Enduring Importance of Physical Artifacts. When discussing their memory artifacts, participants frequently mentioned their sensorial appeal. The smell of books and vinyl (per Richard, “it smells right”), the heavy silvering of gelatin silver prints that shine in sunlight, the crinkling of water-damaged paper—all were remarked upon in sessions. Linda stated, “I like tangible things (...) I guess I’m old-fashioned, but I just prefer touching and feeling.” Participants such as Richard mentioned the patina of age on their memory artifacts as positive, showing the artifact had withstood time or been well-loved, “For me, it’s nice to see how it’s been worn, worn as it has aged.” By way of example, Mary brought in her family cookbook—a lined-paper collection of recipes from her mother and herself, in different inks and formats with cellophane taped additions. As we went through the collection, sprinkles fell from the book block; the most well-loved recipes were easily spotted, splattered by cooking oils and sauces. Per Mary,

It’s the sensuousness of the touch (...) the food spots, those types of things. There’s something about holding it... it’s nice holding something, something in your hand, and turning the page, feeling the brittleness of the paper.

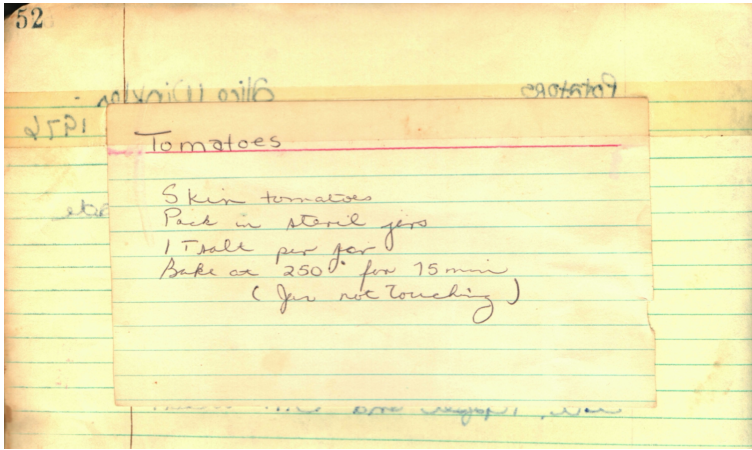


Fig. 2. Example of texture within family cookbook

For participants like Mary, a physical encounter with a memory artifact can contain insights and affect that a digital encounter cannot. This could be seen in the respectful way participants held artifacts that previous generations had handled. Touching memory artifacts created a physical connection with the past, a reaching out over time. Participants such as Pamela, Sharon, and Linda discussed feeling closer to history with their memory artifacts in hand with Linda stating it was “like feeling the spirit of somebody” while Barbara wondered, “what here (...) could possibly be digitized without loss? I think in the end, the physicality of the objects is important to me.” These affective qualities can be understood in the language used during these encounters. For instance, participants would discuss “passing down” a physical artifact, but when scanned, the digital artifact would be “shared.” In sum, physical artifacts were enduringly important to participants and that did not change after encounters with its digital version.

4.3.2 *The Digital Artifact and Scanning as Practice.*

The Digital Artifact. When scanning her artifacts, Pamela stated, “you can never have too many ways of storing certain things that you can never get back.” As such, participants found it to be an exciting and necessary practice. Scanning resulted in digital artifacts—in essence, copies of the physical artifact. However, participants did not consider the digital artifacts as “copies” of the physical artifacts but, instead, unique artifacts. After our scanning session, Barbara reasoned,

I’m thinking, now I have them in digital versions, does that mean I’m gonna get rid of the non-digital versions? I don’t think so. But some of them will degrade. Some of them will crumble and photographs fade out. In a sense, I think what I’ve been reflecting on is whether these are replacements [for physical artifacts] or something else entirely and I’ve decided that they’re something else rather than replacements for the things themselves.

Instead of replications of physical artifacts, digital copies were “something else,” with unique properties and affordances. Participants mentioned the general affordances of digital objects during our sessions: they were persistent (per Sharon, “things that are subject to degradation, it’s really important [to digitize]”), transportable (per Mary, “If I had to flee from a fire, I wouldn’t be bringing six boxes of photos, [digital] ones are easy to transport”), and shareable (per Sandra, “I just felt that it was important to not have this stuff be passed down to only one person as it was to me”).

Additionally, participants discussed the possibility of connecting these digital artifacts with other digital artifacts. Carol mentioned adding some of our scanned artifacts to various projects already in progress. For instance, Carol's book of letters featured scans of the original letters ("more to get a feel of how they were writing rather than the actual content of what that particular letter said") while also connecting the letters to online addenda—footnote links to further information on concurrent historical events or genealogical record. Another participant, Debra, mentioned linking scanned photographs to historical records and genealogical websites. She ran a blog combining her scanned photographs, genealogical records, and creative writing. Per Debra,

One of the things that I started was my own website for telling life stories—instead of just doing "this person was born on this date," I do lives in story format. "She was only 10 years old when she stepped off the boat," I tell lives as story...

Here, the internet facilitates records, historical documents, and further information about the period, to which Debra adds her own photographs, prose, and poetry—in short, she imaginatively extends her digitized artifacts by connecting them to other documents and fictions.

However, participants were also apprehensive about or otherwise faced difficulties with digital artifacts. Participants noted the additional layers of digital mediation: per Pamela, "one of the benefits of physical objects [is] not having an intermediary. Sometimes, some of these intermediaries are obviously more trouble than they're worth." In these complaints is the assertion that a physical photograph is mediated once—for instance, a photograph on photographic paper. In contrast, a digital photograph has multiple mediations—for instance, a photograph in a digital folder on Facebook on a computer. Nancy mentioned the impossibility of knowing at a glance what was on a thumb drive, unlike the photo album: "I don't even know what's on my thumb drives, because I can't see it...it says, 'Photos'. What photos? So, I am troubled by digital information."

Additionally, multiple mediations can lead to multiple pressure points for breakdown. Patricia summed up this feeling: "In my lifetime of electronics, I've lost stuff because a hard drive croaked and I couldn't get things recovered." Similarly, participants grappled with the uncertain lifespan of scanned artifacts. Participants mentioned how technologies have come and gone in their lifetimes and wondered if (and when) current formats and storage methods would become obsolete. For instance, Maria was most concerned about "how technology changes" and worried "these pictures won't be maintained" in new technologies. In her words, "technology doesn't last forever (...) so much has changed. It's hard to know what will come in the future." Some participants felt more comfortable with their physical artifacts that have no opportunities to become obsolete.

Finally, participants had trouble with technology. During our sessions, participants noted the finicky nature of scanning. In this way, technology use always requires a base of knowledge and practice (per Pamela, "I had trouble opening up that zip file that you sent me, I was going to humbly ask you to send me it in another format"). Additionally, scanning can be done wrong or can exclude certain parts of an object. Sandra was scanning her photographs on her own with a paid helper. As we went through some of her childhood photographs, she noticed they had been scanned incorrectly: "Let me show you a photo...where is it...oh, why am I cut off? I'm supposed to be right there." Similarly, while paper-based artifacts were relatively easy to scan, issues had to be navigated. For instance, how to capture a document longer than the scanner? How to scan in a document with a binding or a frame? For other objects—a beer can, a commemorative button—taking a photo sufficed but did not capture its depth and dimension. Another technology issue: some participants did not realize they could scan objects so easily. Without an impetus, the possibility had not presented itself. Per Mary, "I didn't know I could. But I definitely would if I had a scanner, but I don't have a scanner. (...) I didn't know the library had that kind of stuff. You could bring the scanner home and... Wow, that's great to know."

Scanning as Practice. Scanning is labor-intensive. The practice requires the participant to line up the artifact exactly, activate a scanning tool, send it through the scanner, and ensure it has been scanned well. This process can take a few minutes to capture the totality of a memory artifact like a photograph or letter. This could be seen as a negative; however, in our sessions, the embodied process of scanning artifacts proved to be an important step in personal curation. As a practice, scanning opened up the possibilities of memory artifacts and the acts of preservation and divestment.

During this process, it was necessary to encounter the memory artifact. The artifact must be held and handled—*felt*, sometimes deeply. This allowed participants to reconnect and re-encounter their memory artifacts, sometimes providing a spark of memory. When looking at Maria’s memory artifacts,

I think when you look at the pictures, you remember the happy memories, you know, the birthdays and the Christmas parties... but this is my brother who was killed in a car accident [when] he was 17. When I look at his pictures, I often get sad. Even though he was a funny, funny person... seeing these pictures of him, brings back bittersweet memories. Also, when I look at the pictures of my mom, after my brother died, she never looked the same. She never really looked joyful again. It’s very emotional for me.

While holding the image and in the pauses while the photograph goes through its scanning process, Maria considers the memories associated with the image. The process of scanning necessarily forces a connection with artifacts. In the words of Michael, looking at his memory artifacts and talking about them made his memories more “explicit, concretized them in my brain—maybe in that sense it [has] advanced my memories? I don’t know.” Similarly, William said the process of looking at his memory artifacts allowed him to “review [them] and maybe reinforce [them]. (...) I think that this picture tells its own story and it’s nice to relive that story.”

As this process is laborious, participants tended to judge each potential action they took. The effort of scanning each artifact makes it challenging to keep everything and, as such, it is necessarily a process of curation. The moments of connection are also moments of consideration: to preserve or divest? Participants sifted through collections of letters, looked through photo albums and boxes, and otherwise tried to find their most meaningful memory artifacts to scan. For example, Shirley shuffled through black and white photographs, looking at each of them before deciding, “I’m not sure we need to scan in any of these...”

4.4 Preservation of Context, Meaning, and Marginalia

4.4.1 Preservation of Context, Meaning, and Marginalia in Physical Artifacts. The process of personal curation is primarily one of organizing, displaying, preserving, and divesting physical memory objects. It is a unique, personal practice, complex in its past, present, and future considerations. In our cultural probe process, participants scanned their memory artifacts, digitizing a diverse array of objects—photographs, letters, books, ticket stubs, cards, pins, cans, paintings, the grain of a table, etc. Upon request, participants could frequently situate their memory artifacts in time and space and offer further contextualizing information. In the case of a photograph, for instance, the generalized date (“mid-1960s”, “Easter”), location (“our home in Allen Park”), people (“my dad and his brothers”), and invisible photographer (“my mom”) could be recollected. However, this contextualizing information was rarely recorded with few exceptions and was not considered necessary to preserve alongside the memory artifact. When asked *how* these memories were being preserved, participants said they did not need to be preserved—they were remembered.

Even when certain contextualizing information had been recorded, it was often minimal, such as the date of a photograph. For instance, Mary discussed her practice of writing down the date

of when she purchased furniture, "Like when I bought this rocking chair when my first child was born, I wrote the date at the bottom of the chair. (...) I don't think anybody knows that except my one daughter." However, this record did not capture the significance of this date and its purchase (the "memory"). Some participants did capture contextualizing information and further marginalia in their personal curation practices. For instance, Nancy was an avid collector of art pieces, predominately vases and other sculpture work, collected over a lifetime with her husband. To our cultural probe session, Nancy brought a homemade catalog of the collection she had created for her children. Each object in her collection had a page with original receipts, biographies of artists, clippings from auctions, handwritten notes, and memories about the day each object was purchased alongside a photograph of the piece. Here, pieces of contextualizing information were captured—with this catalog, memories, dates, individuals, and beyond were captured.

Patricia was a quilter and would make bespoke memory artifacts for friends and family. Utilizing knowledge of the individual and incorporating objects from friends and family members, she would tailor-make quilts that reflected the individual ("I try to make them about you"). On the back of each personalized quilt would be a hand-stitched plaque with the date of its creation, a name for the quilt, the recipient's name, and a memory Patricia had of the person. In this way, memory artifacts became incorporated into a larger memory artifact and this interplay was contextualized through a stitched plaque. Additionally, Patricia would make photo booklets of each quilt's manufacturing process to be presented to the individual with the quilt.

In the above examples, preservation of context, meaning, and marginalia were privileged in the curatorial process for others. However, these examples were rare. More often than not, participants had no preserved memories and little preserved contextualization. This precarity was only noted retrospectively when details had been forgotten.

4.4.2 Preservation of Context, Meaning, and Marginalia in Digital Artifacts. Two to three weeks after our cultural probe sessions, we conducted interviews and asked participants how they had stored their scanned memory artifacts. For the most part, the storage of digital artifacts was undertaken in a manner similar to participants' physical artifacts. Some participants had stored the digital artifacts in folders. Like in the above discussion of multiple temporalities, these folders often existed not in chronological time but in associative time, organized by space, object, or individual. Predominantly, participants had not organized their digital artifacts, leaving them in the identical form and order as they had been scanned. In this way, a photograph of one's father from the 1950s, an heirloom book from the early 20th century, and a contemporary business card would be in sequence with the nondescript titles IMAG0081.JPG, IMAG0082.JPG, and IMAG0083.JPG. This random assortment recalls the storage methods used for physical objects, as in the case of Mary who had her photographs in the "drawers of obscure tables, underneath sweaters and things, absolutely no rhyme or reason." With digital artifacts, personal curation begins again, and participants fall into ongoing habits and practices.

The falling back on habits found in each individual's history of personal curation extends to a lack of preservation of context, meaning, and marginalia. Even in positive instances of context preservation (for instance, making a file folder for only images of one person), the totality of context escapes preservation (the date is not captured, the names of other individuals in a photograph are not captured, the location is not captured). Additionally, the digitization of physical memory artifacts can divorce artifacts from context—as when the back of a photograph that features a date or handwritten note is not also scanned in. Few participants attached memories or remembrances to their digital artifacts. As such, while the practice of scanning forces curation through remembrance (is this significant enough to scan in?), the reasons for curation (*why* was this significant enough to scan in?) are not captured. When remarking upon her preservation strategies, Patricia said, "some

stories will be lost forever (...) not everybody wants to do this or can afford to do it (...) or that they want to take the time to do it. Some stories will shine.” For Nancy, curation is a practice that is not taught,

Who teaches you what’s important to keep? You know, who teaches you that? (...) How do you curate all these things together so that they begin to make sense, either in a scrapbook or a photo album, or a digital scrapbook, or whatever it is? Nobody teaches us how to do that. There’s no class that I’m aware of in preservation when you’re in your early 20s, or starting your own family or something. Just nobody teaches you that stuff.

In sum, scanning can provide a spark of remembrance by forcing an embodied action and can preserve memory artifacts in their present physical state. This process can be expressed as “stilling time” in its preservation of an object at the time of digitization. However, memory artifacts are not just artifacts—they are *memory* artifacts. In this way, digital preservation has the same issues as physical preservation: context, meaning, and other marginalia are not often captured or captured effectively.

5 DISCUSSION

In this paper, we investigated the memory artifacts and personal curation practices of older adults to further understand the complexities of curating artifacts and crafting narrative legacies. Additionally, this work illuminates the relationships between the past, present, and future, as well as the self and others, when considering memory and personal curation. We attended to (1) how personal curation affects memory artifacts (2) how personal curation is a practice done for different actors (3) how time influences personal curation and memory artifacts (4) how digital artifacts are distinct (5) how digitization is an embodied human-computer interaction that changes personal curation and (6) how participants do or do not preserve context, meaning, and marginalia. Our results draw attention to the heterogeneity of both memory artifacts and the practices of individuals.

In the sections that follow, we first synthesize our findings to summarize what are the personal curation practices of older adults (RQ1) and how the varied forms of personal curation affect memory artifacts (RQ2) through a series of productive tensions. The tensions felt by participants throughout the study informed their practices of personal curation and their relationships with memory artifacts, which illustrates the precarity of memory. With this precarity in mind, we elaborate upon the potential of digitization (RQ3) and human-computer interaction to support personal curation and memory artifacts. In particular, we discuss potential practices for personal curation and design considerations in four ways: (1) raising awareness (2) supporting preservation and documentation (3) supporting recontextualization and (4) supporting forgetting.

5.1 The Tensions of Personal Curation

Our findings have illustrated salient tensions within the home archive. Personal curation is a delicate, affective, and complex practice, and the decision to preserve or divest is predicated on considerations that decide what memories and family histories persist into the future. The heterogeneous nature of these imbricating tensions is unique to each individual and can only be effectively navigated by each individual themselves. By way of example, consider the above post-digitization and personal curation practices. Participants like Debra felt the act of digitization allowed them to divest from a physical copy—the artifact had been preserved in another form. Others felt digitization was reserved for artifacts of value and that those artifacts would be kept in both forms—one can never have too many ways of storing certain things of importance. Others still felt a digital artifact was prized for its new affordances—a digital artifact could be made into a collage or shared widely—but was no

substitute for the genuine article. All these feelings were predicated on the individual participant's judgments. This points to the importance of consideration and collaboration when designing systems for personal curation and for presenting curators with multiple possible approaches.

Below, we discuss three imbricating forms these tensions took. Such tensions are due, in part, to memory artifacts' roles as boundary objects—"objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" [97, p.393]. As such, memory artifacts represent a boundary between different actors, different moments in time, and different materials.

Social Tension. This work has shown how personal curation is an act done for different individuals or communities. Individual memory is always in relation to collective memory—a social, shared body of layered remembrances [45]. Groups have their own collective memory that is unique and unified by a corpus of embodied remembrances [109]. This act of constitution [2] can create collective memory—or, otherwise, tensions at mutual sites, like memory artifacts. For the curator, personal curation is done for oneself—acts in the present done for present appreciation based on individual affective response and connection. Personal curation for the family changes the lens through which memory artifacts are viewed. No longer was a personal response suitable criteria by which to value a memory artifact. Instead, participants had to place themselves in the minds of family members. Tension can arise here, in this opening up of the memory artifact, as the conveyance of affect and memory proves difficult. Tensions also arose as family members made their disinterest explicit. Knowing one's family was disinterested had a chilling effect on participants' desire to provide context or to curate their memory artifacts.

In previous research, families who do not understand the significance of memory artifacts can disrupt an individual's sense of self and play a detrimental role in deciding what stays and what goes in practices of forced familial curation and divestment [7, 18]. Social tensions are present in CSCW research on memory artifacts, such as when one family members' interaction with a platform becomes a point of tension for other family members [19]. In the work of Jones and Ackerman, family secrets, lies, and silences can present social tension: even well-intentioned discretion can confound family members [48]. Elsewhere, in the community setting, a memory artifact can mean different things to different people (e.g., [31]). In this way, if "with regard to our pasts, we are all creators and artists", tensions arise when observations and reconstructions between individuals and groups do not align [5, p.77].

Temporal Tension. The passage of time alters one's relationship to everything else—one's body, one's mind, one's possessions. This creates tensions within the memory assemblage as participants confront change as it presents itself in their memory artifacts. Such a tension has been explored in the work of Pinter et al, where changing identity over time leads to a reconsideration of meaningful possessions and their management [80].

Participants noted the degradation in the materials that comprised their memory artifacts or wondered aloud what compelled them to keep certain artifacts over the decades. Memory artifacts such as photographs are equally legitimate records of moments, places, and relationships and vessels for personal meaning that can trigger further memories and meaning beyond that which is present to the outside observer. For participants, this combination made time's effect clear—a record of faces, places, and relationships that have all changed. Participants pointed to these changes in relation to the photograph's documentation, a tension between what is and what once was [96]. Additionally, participants struggled to remember the importance of memory artifacts, as some memories fade with time. In a senescence sense, memory itself changes over time [10] and yet, memory creates a narrative continuity in one's life. This tension between remembering and unintentional forgetting led to frustration for participants.

There was a tension between present and future needs. Participants had to consider the significance of memory artifacts and their movement through time. For participants, some memory artifacts felt significant in one moment only to feel insignificant in the future and vice versa. Recall Nancy's preservation of her children's artwork or Mary's husband and the renewed significance of artifacts tied to his mother. In these moments, future importance is impossible to grasp in the present. Similarly, present needs—like the need to downsize—may complicate personal curation for the future and have unintended consequences. A divestment in the present may complicate meaning-making and wellness in the future [18]. This may speak to the reason why participants struggled to fully divest from memory artifacts, even when they feel insignificant [50].

Material Tension. For participants, there was a tension between digital and physical artifacts. Digitization made digital artifacts that lacked authenticity, a link with the past. Recall that participants felt digital artifacts were not “the same”, complicating their value. If the touch of furrowed yellowed paper, the shimmer of silvered prints, and the feeling of touching something that was touched by one's ancestors is not translated into a new medium or form, what is? If memory and meaning are notoriously finicky [93] then a digital shift can be a difficult transition when the familiar sensuous tactility of an object is lost. Perhaps this is why participants considered digital artifacts to be “something else”—not a direct, substitutive copy but instead a new artifact.

Another tension with digital artifacts as discussed in previous work: the ever-expanding cache of digital information creates a digital space in which “everything is easily available” but “nothing is commandingly present” [13]. Coined “the infinite basement,” the relatively unlimited storage capacity of online space allows for the accumulation of personal data with little personal curation [46]. For participants who already struggle with the personal curation of physical memory artifacts, the addition of another material form adds an extra layer of labor that may be untenable.

5.2 Considerations Supporting Personal Curation of Memory Artifacts

Personal curation practices, histories, and memories are each and together built upon an installed base. Present practices are emergent and built on the practices of previous generations [14]. That which came before has informed what memories and histories made it into the present; what we know now has been built on what we remember from then. In this research, we note that absence looms large as participants wrestle with the limitations of their curatorial installed base. Without curation, participants were overwhelmed by full houses of artifacts. With little to no contextualizing information, heirloom memory artifacts became artifacts with little meaning. With the passing of previous generations, participants had no one to recollect meaning, to rescue meaning from oblivion. As a consequence, memory artifacts lost their (re)constructive potential [75]. Situating our findings in the fields of CSCW and HCI, aging research, and memory studies, we discuss four design considerations for personal curation drawn from our findings: (1) Raising Awareness (2) Supporting Preservation and Documentation (3) Supporting Recontextualization and (4) Supporting Forgetting. These design considerations are converted into personal considerations for older adults in Table 2. In doing so, we highlight the importance of personal curation as a practice and its potential impact on future individuals, families, and communities. In unpacking these implications, we hope to provide an overview of research on curation practices and how digital technologies can be improved to honor the preferences of older adult curators.

5.2.1 Raising Awareness. As stated above, it is necessary to anticipate unbidden absence and facilitate best practices. The first step in this process is to draw attention to the tensions within personal curation and to provide information about the practice. For some participants, the practice was indefinitely deferred, postponed until a later, ill-defined date—“passive preservation” [46]. For these participants, previous research has noted the necessity of a push to feel the urgency of personal

curation [107]. Other participants did not know where to begin. Recall Nancy, who stated curation was not a practice that had been taught to her, or Mary, who was unaware that scanning was a potential practice she could undertake herself. In empowerment research, presenting individuals with new information can catalyze change [28, 60]. In HCI, technology has been framed as a tool that allows users to extend out their knowledge and benefit from this extension [91]. However, as noted by Bardzell, design can constrict practice and normalize certain behaviors [9]. We wish to maintain the heterogeneity of personal curation practices—practices that should be informed by the affective and relational dimensions of memory. Therefore, we believe that presenting broad possible approaches (see Table 2) would motivate individuals while not restricting individuals to a specific schema.

In raising awareness, designers should emphasize not just the importance of curation itself but what is curated. As noted by other CSCW research, curation is not just for the artifact but its attendant meaning [46]. For instance, in their discussion of ephemeral media, Cavalcanti et al. referred to media loss (the artifact itself), meaning loss (the emotional and social significance), and context loss (the situated significance) [17]. Participants such as Sharon discovered this too late, when meaning and context had been separated from media. Raising awareness of this impending loss may be a key to catalyze change.

5.2.2 Supporting Contextualization. Without contextualization, memory artifacts lose meaning over time. In our study, participants had forgotten context or key details—recall Shirley, who wished she could remember more of her own life stories. Despite the mysteries [48] and gaps in their memory, participants frequently did not contextualize their own memory artifacts and, therefore, do not “mitigate the risk of having them disposed by others” [90, p.158]. Contextual information such as the date, location, or individuals within a photograph were often not written down and memories or meaning were not captured in any form. For a select few participants, such preservation was taking place. Recall Mary, who would write down purchase dates of artifacts like furniture, or Carol, who had annotated her parents’ hand-written letters. These participants used their contextualization practices to inform our conversations about their past.

However, while living with this project’s scanned memory artifacts for two to three weeks, participants did not contextualize them digitally. This may be due to the same deferral logics that preclude contextualization with physical memory artifacts: I will get to it at an unspecified, later date when I have more time. It may be due to a lack of familiarity with metadata and digital contextualization—an issue that speaks to 5.2.1. Additionally, it may speak to the difficulty of integrating memory with memory artifact (such as laborious or hidden features: right click → get info → use “comment” field to add context) or the lack of creative possibilities for such context preservation. Designers should support contextualization as a practice, presenting opportunities for the preservation of not just the artifact itself but its accompanying memories, histories, and ephemera—preserving not just an artifact but a *memory* artifact. Previous research has discussed this practice as “encourag(ing) storytelling” [98] through the use of audio annotations [77] or written methods to convey the meaning of an artifact over time [59]. As noted in 4.1, personal curation is a practice with considerations for oneself, one’s family, and one’s greater community. Such systems of contextualization can support each form of curation. Consider the Oxfam Shelflife initiative, where patrons of the Oxfam charity shops were asked to attach a QR code to donated artifacts that, when scanned, would present stories about the artifact. Here, community connection was facilitated through the stories, with the artifacts taking on a new meaning for shoppers [25].

Such systems should be designed to support user logics of personal curation. For instance, a museum archive formalizes what is captured and traditionally stores the date, medium, dimensions, and owner of an object. The heterogeneity of personal curation and memory artifacts make such

standardization moot—each memory artifact should be contextualized with whatever information the individual thinks would illuminate it through time. In this way, both the individual memory artifacts and their collective potential as an archive become an expression of the curator. When considering the mixed media of Mary’s cookbook—layers of cellophane tape, notecards, magazine clippings, notes, and collateral damage from cooking—the cookbook itself acts as an archive organized according to Mary, apart from the individual recipes that speak to stories of holidays and family gatherings.

This emphasis on contextualization speaks to a focus on manual action. While the rhetoric of the digitization company suggests you can “save your irreplaceable memories” through automated digitization, such a process purely captures the artifact itself, not its depth of meaning. This lack of context ensures future limitations. As previous research has noted [107] and our research further confirms, personal curation cannot be fully automated, and personal reflection cannot be outsourced. Consider the practice of bulk digitization through a third party: the digitization and curatorial labor have been misplaced, given to a neutral party that automatically digitizes documents regardless of their meaning or affective value. In the case of bulk digitization, the individual acquires an identical collection in a new medium, replete with the issues of its progenitor. As such, automating features need to be applied delicately, lest replicate problems of an “infinite basement” of data. Cai et al. highlight the value of “waiting time”, the time that “occurs amidst existing tasks” [16, p.5]. Cai et al. compose within waiting time a design space for wait-learning—small opportunities for learning [16]. In our research, we make note of waiting time as an integral aspect of scanning. While artifacts were being scanned, participants took these moments to consider the artifacts, watching the process of their scanning while filling the time with stories. Within the waiting time for each scan was a small opportunity for contextualization—to convey what made the artifact worth preserving in a new medium.

Finally, it is important to remember Patricia who stated that not everyone has the time nor money to preserve their memory artifacts. Thus, socioeconomic conditions may preclude personal curation for some individuals, families, and communities; time may privilege some stories. Preservation is laborious and the outsourcing of digitization to a third party is expensive. In keeping with issues of institutional curation [112], preservation is political. The monetary, emotional, and time burden of preserving one’s history and memory should be considered and, if possible, lessened.

5.2.3 Supporting Recontextualization. Halbwachs discussed the act of remembrance as a “reconstruction of the past achieved with data borrowed from the present” [38]. In the act of personal curation and in the life of a memory artifact, it is important to consider relational context [27]. Multiple recontextualizations occur [68]. Memories change over time and each time a memory is remembered, it is being recontextualized through the present. Recall Maria and her past reflections on her home through the vantage point of her present aging-in-place practices. Participants preserve some memory artifacts and not others, recontextualizing the narrative of a memory artifact. One photograph can become symbolic of an entire moment or feeling as others in its series are divested. Once a memory artifact changes hands, it becomes recontextualized again, fitting in with or set apart from memory artifacts in a new collection. Recall Barbara’s oil painting of an ancestor she knows little about, a family mystery in plain sight. The more people encounter a memory artifact, the more it is recontextualized, with layers of meaning or conflict. Recall Patricia, who corrected and was corrected by her daughter in their ongoing recollections. Finally, a digital artifact can be further recontextualized through its shareability and transmutability. Recall the connections that participants made through the affordances of digital artifacts.

In all these ways and more that remain concealed, recontextualization is a constant process. Lu et. al considered data work as recontextualization work [61]. As such, best practices and future

sociotechnical systems should consider recontextualization. As noted in previous research, “few platforms allow users to fully explore the different kinds of personal meaning available in their data” [102, p.692]. For instance, a traditional archive may be closed to addenda—in other words, artifacts and their descriptions often remain static. For systems that support personal curation, it is necessary to consider the dynamic nature of memory and meaning-making (to ensure the “capability of multiple ‘voices’ ” [98]). In thinking with participants who built new memories atop partially remembered histories and participants who wanted their families to build atop their own memories, design should support further context, footnotes, marginalia, interweaving stories, connections, and more.

This is aligned with previous work that highlights the social aspects and creative sense-making of curation [30, 32] and speaks to the collaborative aspects of CSCW [1]. Here, we need to consider not just the older adult participant in one moment, but the older adult participant in multiple moments, remembering different aspects of a memory artifact, building (or tearing down) past recollections. Additionally, a system to support recontextualization needs to support different individuals with different intentions at different moments. Whether to aid in the “correcting” of a parent or the addition of a personal memory, such a system needs to conceptualize an archive of emergent meaning, with no definitive answer. For instance, where Apple Photos may require a definitive date or location, a system for recontextualization may allow for an archive of manifold dates and locations from multiple parties. In this way, systems should support memory artifacts as boundary objects—those objects that have different meanings and interpretations for different people and, in their existence as a shared point of reference, facilitate communication and connection [57].

5.2.4 Supporting Forgetting. All of this is not to say that the primary function of personal curation is preservation. Divestment is a valued act within personal curation practices, a commitment to purposeful forgetting. In addition, divestment is integral to preservation—that which is forgotten shapes that which is remembered [48]. Recall Nancy who called divestment an act in crafting her legacy. Memory is often defined in opposition to forgetting—recall, for instance, the provocation of Legacybox: “Don’t wait until it’s too late.” Participants too were concerned about “too late.” However, the act of remembering is not in binary opposition to the act of forgetting—they mutually shape one another. For Augé, “Memories are crafted by oblivion as the outlines of the shore are created by the sea” [4, p.20]. The individual must forget to remember or otherwise be saturated. In the work of Jones and Ackerman, the ease of digital retention and boundless storage creates an “infinite basement” of uncured data [46].

CSCW and HCI research is frequently more concerned with remembering than forgetting. The material possibilities of forgetting are less defined than the possibilities for remembering [8]. Recall the interest in life-logging systems that tend to present the day as a series of future-memories to catalog for future recall [111]. The act of personal curation complicates this need for retention by suggesting that not everything can or should be kept for posterity. In this work, there is a generative tension between forgetting and remembering. To practice personal curation is to interpret and, therefore, construct, one’s own life or a family history. Participants discussed their multiple strategies for crafting legacies and the implicit outcomes of these acts are forgetting and remembering.

However, we must know when to forget and when to remember [99]. In contrast to the purposeful forgetting of divestment (i.e., I no longer need *this*), much forgetting described by participants was accidental and unaccounted for until absence made itself known. Here, the creation of material possibilities for the documentation and recontextualization of memory artifacts also creates possibilities to support the act of divestment and forgetting. Recall the importance of digitization as practice: the practice of scanning gave participants a chance to encounter memories artifacts and

reflect on their importance, as in the case of Shirley and her decision not to scan non-essential memory artifacts. Future designs should emphasize this moment of encounter, a valued interaction between memory holder and memory artifact. In this moment of encounter, the potential act of preservation is also the potential act of divestment and vice versa—that is, until a decision is made.

Considerations for Older Adults	Possible Approaches
Raising Awareness	<ul style="list-style-type: none">• Acknowledge personal curation is laborious and never finalized• Note that digitization and digital artifact curation requires additional labor• Recognize that digital artifacts are unique to their physical counterparts
Supporting Preservation and Documentation	<ul style="list-style-type: none">• Digitize memory artifacts that feel meaningful• Commit to small steps towards preservation and divestment• Try to capture as much contextual information as is possible• Involve family in personal curation but recognize potential for conflict
Supporting Recontextualization	<ul style="list-style-type: none">• Plan for recontextualization• Recognize that value is subjective and changes over time• Consider the different meanings that an artifact has for different people
Supporting Forgetting	<ul style="list-style-type: none">• Note that divestment is also an act of personal curation• Allow for moments of reflection

Table 2. Considerations for older adults, to support personal curation practices. Gleaned from research and further communication with participants.

6 LIMITATIONS

While this work was an attempt to provide rich contextual data on the process of personal curation and the affective nature of memory artifacts, this study was limited to a specific context—participants were recruited from one city and one village in one state in the U.S. The demographics of our participants do not reflect a representative sample of the U.S. older adult population in terms of gender, race, cultural background, and socioeconomic status. For instance, do the acts of emigration or immigration influence personal curation? Future work can consider replicating this work with people and communities of different backgrounds.

7 CONCLUSION

Through interview and design probe sessions with 16 older adults, this work has investigated individuals’ practices of preserving, collecting, and divesting memory artifacts. As the boundary objects between the present and the past, memory artifacts can provide a narrative through their associations with the past—and can, as such, inform memory, tie individuals to past relationships, and have symbolic meanings for families and communities at large. This work also highlighted the challenges and tensions of personal curation concerning time, technology, and additional actors like family members. One particular challenge was preserving contextual information—like memories—that give memory artifacts their affective power. Without this information being passed down or otherwise captured, memory artifacts become artifacts divorced from their significance. This work also identified the key opportunities and challenges that digitization brings to the process of personal curation. While memory artifacts are transferred into a digital environment, divestment becomes less necessary and preservation seems easier. In sum, this work extends a collection of CSCW/HCI literature investigating technology to preserve memory and extend the value of memory artifacts. This work highlights the importance of digitization as a practice that forces an embodied and reflective action between memory artifacts and memory holders. Improving

the design of digitization and personal curation systems can empower older adults to make more informed personal curation decisions, retain more individual and collective memory and history over time, and benefit and sustain families and communities.

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A SURVEY QUESTIONS

Survey Responses	N	%
Do you use digital technologies to: communicate with families and friends?		
Definitely not	0	0.0%
Probably not	0	0.0%
Might or might not	1	6.7%
Probably yes	1	6.7%
Definitely yes	13	86.6%
Do you use digital technologies to: search and retrieve information?		
Definitely not	0	0.0%
Probably not	0	0.0%
Might or might not	1	6.7%
Probably yes	1	6.7%
Definitely yes	13	86.6%
Do you use digital technologies to: store information and documents?		
Definitely not	0	0.0%
Probably not	1	6.7%
Might or might not	2	13.3%
Probably yes	1	6.7%
Definitely yes	11	73.3%
How important are possessions to you? (Objects that remind you of a time, place, person, or memory)		
Not at all important	0	0.0%
Slightly important	0	0.0%
Moderately important	5	31.3%
Very important	6	37.4%
Extremely important	5	31.3%
How difficult is it or would it be for you to part with your possessions?		
Extremely easy	0	0.0%
Somewhat easy	1	6.2%
Neither easy nor difficult	1	6.2%
Somewhat difficult	9	56.3%
Extremely difficult	5	31.3%

Survey Responses	N	%
I use: a smartphone		
Definitely not	0	0.0%
Probably not	0	0.0%
Might or might not	0	0.0%
Probably yes	0	0.0%
Definitely yes	16	100.0%
I use: a computer/laptop		
Definitely not	0	0.0%
Probably not	1	6.2%
Might or might not	0	0.0%
Probably yes	0	0.0%
Definitely yes	15	93.8%
I use: the internet		
Definitely not	0	0.0%
Probably not	0	0.0%
Might or might not	0	0.0%
Probably yes	1	6.2%
Definitely yes	15	93.8%
I use: social media		
Definitely not	0	0.0%
Probably not	2	12.6%
Might or might not	3	18.8%
Probably yes	0	0.0%
Definitely yes	11	68.8%
I use: cloud or online storage		
Definitely not	1	6.2%
Probably not	0	0.0%
Might or might not	4	25%
Probably yes	4	25%
Definitely yes	7	43.8%
Overall, I feel comfortable around technology		
Extremely uncomfortable	0	0.0%
Somewhat uncomfortable	1	6.2%
Neither comfortable nor uncomfortable	0	0.0%
Somewhat comfortable	10	62.5%
Extremely comfortable	5	31.3%

B FREE-TEXT RESPONSES

- Mary Photographs, books, greeting cards, letters, postcards, plants, emails, drawings, poems
- Linda China pitcher from my maternal grandmother, child's rocking chair, adult rocking chair belonging to my paternal grandparents, Christmas ornament from my long-time friend, grandmothers' and mother's engagement rings, postcard from my husband, moon phase watch, Barbie doll, U. S. Supreme Court admission certificate, wedding photograph, tablecloth
- William Tennis racquet, personal computer, my car, Facebook, my daughter's photo album she gave to us on our 50th anniversary, my high school yearbook, my father's photo album, my tennis shoes, my wife's wedding ring, my tennis playing friends and my home
- Pamela Rings, bracelets, fine china, crystal, photo, tops, socks, shoes, craft works, bed, chest of drawers, vanity, dresser, art objects
- Carol N/A
- Patricia Cell phone, iPad mini, desktop, scrapbooks, books, boxes of photos, camera, boxes of 8mm, CDs, thumbdrives
- Linda 1) piano 2) photo albums 3) high school 5-year diary 4) my cat, Jack 5) iPhone 6) VHS tapes 7) mother's pots and pans 8) wedding rings 9) silver box containing genealogy subjects 10) high school yearbooks 11) email 12) lake house 13) current home for 56 years 14) children's school papers and projects 15) nurses cap and cape 16) iMac 17) a dress my mother made for me 65 years ago
- Michael Various photos/paintings/artwork. Some furniture pieces. Books. Various collected trinkets.
- Sandra External hard drive, scanned family photos on computer, prayer book, Queen Elizabeth coronation memorabilia, Chinese brass bowl and stand, wooden works Grandfather clock, "House By the Side of the Road" poem framed, dining room table, angel ceramic figurine, old books from great-grandmother, framed oil painting, mahogany armoire, framed cottage watercolor, many other things—I've lost count!
- Richard My vinyl collection. 'Ballerina' lamp. Apple Mac Plus computer. Various glass Xmas tree ornaments. My numerous bicycle patches. My bedroom furniture. A photo of three of my dogs in winter. My wedding ring. Picture of my mom & me. Iron City wall lamp. Pittsburgh Pirates 1960 pennant. Lone Wolf painting. Evergreen tree in back yard. iPod w/50th b-day inscription
- Nancy photo albums, piano music, riding boots, house phone number, set of china, grapefruit knife, zuni ring, children's books, wedding ring, sweatshirt
- Maria Pictures. Jewelry (wedding ring), St Christopher medal for the car, refrigerator magnets from trips, tea service (gift from mom), nurses pin, baby items, Lladro nurse statue, heart within a heart.
- Barbara (1) my great-grandmother's sewing table; (2) my grandmother's cloisonne decorative bottle; (3) my mother's Mexican wooden dove; (4) my father's copy of A Green Bough; (5) my copy of the OED; (6) my mother-in-law's lamp; (7) my photograph of my parents at the time of their engagement; (8) my parents' alebrije; (9) my wedding ring; (10-15) some particular photos of my husband, daughters and grandchild
- Sharon iPhone, photographs, slides, books, dresses, scarves,
- Debra My iPhone, My computer, A digital photo frame, Photo albums, A china cupboard, boxes of misc. items, Google photos
- Shirley N/A

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