Data and Power: Archival Appraisal Theory as a Framework for Data Preservation

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Digital data pervades everyday life, from personal photos shared on social media to voice commands for Amazon Alexa. A widespread industry culture of "move fast and break things," however, has compelled data management practices that prioritize profit over preservation. This paper draws from archival theories of appraisal to foreground control, power, subjectivity, and emotion in computing practices that treat data storage as a neutral or objective cost-center. We draw on postmodern archival appraisal theory that recognizes the archive as a powerful and subjective curator of identity and memory. The theoretical basis of archival decision practices, in turn, establishes the value of the archival record and thus the need to save it. With three primary issues of appraisal theory as a framework, we report on an interview study with adults (N=17), ages 51-72, who are in a transitional life-stage that focuses them on their experiences and memories that are worth keeping or discarding. We sketch implications for data management paths that forefront legacy, life transitions, precarity, and control.

CCS Concepts: • **Human-centered computing** → **Computer supported cooperative work**.

Additional Key Words and Phrases: archives, archival theory, social media, aging, older adults, power, data

1 INTRODUCTION

If you could preserve just some of your digital data 15, 30, or 100 years into the future, what would you choose to save? People have a basic impulse to save and protect artifacts as evidence of their presence in the world [58]. This instinct manifests itself throughout the long history of the written record such as Egyptian hieroglyphs, through primal burial grounds such as the Giza Necropolis, and through ancient jewels made of bone, berries, and stone. These historical markers persist today—written language, cemeteries, and jewelry—as richly evolved cultural practices. Deep scholarship across the disciplines has shown that human desires to develop the self, preserve memory, imbue artifacts with meaning, and pass on a legacy drive decisions to save [18].

The choice of what to save, in what form, and under whose authority is also the essence of archival appraisal theory. Archival theory has deep roots in the emergence of bureaucratic recordkeeping practices, modern document reproduction technologies, and evolution of memory practices by organizations and individuals [46]. The study of the past, present, and future of recordkeeping is formalized in the field of archival science, which studies the theory and practice of preserving, organizing, and providing access to records of human activity [51, 58, 72].

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Today, we find that computing has adopted the language of the "archive" to depict the storage of infrequently used digital content. For example, Gmail provides an "Archive" feature and Twitter allows users to download their entire "Archive." In computing, the etymology of "archive" as a verb refers to the act of transferring digital content to a storage place [72, 77]. Technology companies rely on large-scale automation and algorithmic curation for storing data, giving an impression of neutrality and objectivity. Postmodern archival theory has argued that subjectivity and power are embedded in the archival process, such that the decision about what to store and discard is neither neutral nor objective [72]. The theory and the practices of deciding what is important to keep and what can be destroyed shape collective identity as well as individual practices of remembering and forgetting [15, 46, 66, 72].

This work takes up the agenda of expanding archival theory within the field of computing. We ground this work in an empirical interview study with 17 adults (ages 51-72) about their life transitions and legacies. We focus on adults who are or will soon be moving into older adulthood because they may be thinking about data preservation in meaningful ways associated with life transitions that come with older adulthood. The challenge of storing and managing personal data has been developed over many decades of scholarship in computing. This paper centers archival theory in that scholarship and argues its utility for prioritizing three criteria: what values to encode in archived data, the duration that data should be archived, and archives as instruments of power. We trace points of synergy between computing and archival histories, and highlight where they can come together for data management practice.

2 RELATED WORK

In this section we introduce and propose the relevance of aspects of archival theory that pertain to nature of personal data, including the transition of these theories to postmodern and post-custodial perspectives. We then connect these concepts to extant research on archival practices in computing literature. Finally, we set the stage for our study by describing some salient practices of participants who are moving into older adulthood around values, memories, and technology use.

2.1 Archival Theory

Though Posner has documented that archival practices are a nearly timeless aspect of the human condition [65], modern Western archival theory dates from the Enlightenment era when European royal administrations concentrated official documents in central repositories (archives) and delegated archivists to oversee them as an organic whole [23]. Schellenberg and postwar archival theorists debate, but tend to agree, that the aftermath of the French Revolution extended the value of the archive by endowing government records with the power to protect and advance democratic values through the "civic right" of transparent public access [69]. Schwartz argues that mid-nineteenth century empiricism and "Enlightenment Encyclopaedists" seeking to order our knowledge of the world codified practices that further expanded the authority of the archive. Archivists "promised possession and control of knowledge through possession and control of recorded information" [71]. The archival paradigm reified a notion of passive curators preserving bureaucratic evidence as received, especially that of the state [15]. A fundamental tenet of modern archival theory—from the 19th through late 20th century—was its focus on preserving the possibility of objective truth through neutral practices directed toward a sheltered and protected archive. In this framework, "archivists are mediators and facilitators, custodians and preservers of societal evidence, not documenters and interpreters, or even judges, of societal deeds" [46].

In a postmodern turn influenced by critical theorists across multiple humanities disciplines, current archival thought now recognizes and explores the implications of the subjective and inherently political nature of archival processes [53, 53, 72]. Brothman proposes that the archival

record does not reflect the reality of the past; it is only the raw material for a "purposeful conception of the past" [6]. Piggot and McKemmish argue that nearly the entire range of archival processes from "creation and capture, appraisal, metadata schema, access policies and practices and many other archival activities were always anything but objective and neutral" [62]. Professional practices for selecting and preserving records, even the "objective" records of government and business, are about choosing which narratives will continue to exist through time while discarding others [40]. Hedstrom emphasizes that the archival record is not itself a representation of collective memory. "Archives may be of most value not when collective memory persists, but when they provide the only sources for insight into events and ideas that are long forgotten, rumored but not evidenced, or repressed and secreted away" [34]. The actions and inactions of the archivist strongly influence what will be remembered, and it is this act of remembering and forgetting that is central to notions of individual and social identity [15, 33, 62].

Archival appraisal is the central theoretical concept of archival science [74]. Appraisal is a set of professional practices for assigning value to documentary evidence (regardless of form or format) that is grounded in a deeper theoretical understanding of the complex nature of value and the sustainability of value over time [46]. Appraisal decision making circumscribes the archival control zone is closely allied with human identity and memory practices. Craig notes that "All of us choose things to keep, including documents, as part of making sense of ourselves in a place, in our responsibilities and rights, and in the time we experience" [16]. With varying degrees of quantification and technical rigor, these processes may consider the records' provenance and content, their authenticity and reliability, their order and completeness, their condition and costs to preserve them, and their intrinsic value [74]. A postmodern view of appraisal posits that the practice of assigning value is necessarily subjective; it is during the appraisal process especially that an archivist's world view, domain knowledge, and personal feelings can shape the nature of the archive and through this shaping help determine the stories that a society creates from the record. Storytelling by document is sensitive to subjectivity at all levels of abstraction, ranging from the creation of national identities to the establishment of personal legacies.

Schwartz and Cook suggest that allegiance to the future provides the motivation and a rationale for the agency that archivists exercise over decisions to keep and destroy. "Whether conscious of it or not, archivists are major players in the business of identity politics. Archivists appraise, collect, and preserve the props with which our notions of identity are built. In turn, notions of identity are confirmed and justified as historical documents validated with all their authority as 'evidence' the identity stories so built" [72]. The vehicle through which archivists have traditionally applied archival theory in practice is the organizational archive. Organizational archives exist in corporations, governments, religious organizations, and universities (e.g., The Walt Disney Archives in Burbank, National Archives and Records Administration in Washington, D.C., the Vatican Archives in Rome, and the Bentley Historical Library at the University of Michigan). The often imposing but sometimes hidden physical spaces of the archival repository establish the boundaries within which archivists appraise, protect, and encourage the use of records that comprise the "institutional memory" of an organization [35, 46, 51].

Postmodern archival theory is alive and vibrant in new conceptions of the post-custodial archive. Ham first articulated the concept as a thought exercise to encourage archivists to decenter their intense focus on collecting, holding, and controlling the physical archive [32]. The post-custodial archive posits that the value of the archival record resides within the "original living contexts" of individuals and their communities; archival value is not singularly tied to the socially contingent processes that archivists have developed as a professional warrant [32]. In the context of community-oriented archival records, the defining characteristic is the active participation of community members in defining the terms of control of the archival record. "These terms range from complete

autonomy from the 'mainstream' to the delegation of the custody and preservation of their materials to public-sector archivists and a wide range of options in between" [27]. Archival scholars working to "decolonize" the formal archive are suspicious of records assembled by governments that historically have silenced "native voices" [50]. For example, control of Native American materials and narratives has long been in the hands of non-Native American archives [57]. Harris's study of South African Apartheid describes a "state-imposed amnesia" involving the destruction of a large portion of the state archives as a method of "image-control" [33]. Caswell documents how the Khmer Rouge in Cambodia used photographic documents to justify and enforce mass genocide, though the same photographs are now on display to tourists as national and cultural symbols [8]. Building on their work with aboriginal tribes in Australia, McKemmish and Piggot [51] note that Western archival theory has privileged physical and intellectual dimensions of documents but has overlooked their emotional and spiritual aspects. Archival practices driven by new archival theories now seek to empower communities to overcome historical silences by establishing control over memory practices.

The insights of adaptive post-custodial concepts, when joined with postmodern positioning on control and objectivity, have opened opportunities to define the archival record as present in many contexts other than the organizational or institutional. Such expansive consideration of the non-custodial archive plays out most saliently in the increasing relevance of personal archival information and in the inexorable migration of personal information to corporate-owned technologies, including but certainly not limited to, social media platforms. Scholars have noted that in comparison to institutional archives, personal archives have not benefited extensively from formal theory [35, 51]. Pollard documents the "second-class citizenship" that personal papers, such as letters, diaries, scrapbooks, home movies, have nearly always held in the organizational archive [64]. Fisher notes that both paper and digital personal archives have been "a poor cousin to government archives in the family of archival theory" [26]. Cook argues that a sort of professional snobbery disadvantages archivists who attempt to adapt formal appraisal theories and practices to personal archives and private collections [15]. Beagrie notes that as archivists have responded to demands for the digitization of name-identified personal papers, archivists have faced challenges to their established practices of organization, description, and control of personal privacy and copyright [4].

As the archive increasingly consists of minable and repurposed digital data in distributed and dispersed places and spaces, technology corporations are displacing the archivist as the appraisal agent [52]. The archival aspects of individual or community control over personal data has yet to be thoroughly addressed in the context of the vast amount of transactional data generated by online technology platforms, with and without user knowledge or consent. In revisiting her germinal 1996 article on the social power of the personal record, McKemmish points toward the increasing advantages of distributed digital technologies "that witness to and memorialize an individual life and her place in the collective life in the community—from the perspective of the life of that individual in a continuing 'process of becoming" [49]. The nature of personal records as an atomized network of data, however, is not well understood. Research is needed between scholars of the archive and researchers who design, build, and appraise collaborative, community technologies. Such research could meld the theoretical constructs of archival appraisal as the assignment of value over the long-term with the demands and constraints of contemporary digital technology platforms.

2.2 Archival Theory in Computing

Prior work in computing has explored preservation practices in a variety of contexts, including the value of objects in the home [30, 54, 56], managing personal information (see a review in

[76]), algorithms' influence on news feeds [22, 25], gender transition [31], memorialization [1], and preserving online data [39, 43, 44]. One study found that Facebook users decline to download their Facebook archives even though they would be sorry if those data were lost [73]. Some research suggests that users do indeed perceive long-term value of their Facebook data [42], while other work suggests that they view material on social media as ephemeral, irrelevant, and not worth saving [43, 44]. Throughout this work, we use the language of "data" to reflect raw data stored on servers, as well as associated decisions about how it is assessed, organized, and preserved.

Many studies have noted that users interact with platforms to share and curate their data for selective audiences [44, 48, 84, 85], even though they do not view their timelines as accurate representations of everyday life [73]. There is a tension between what can be shared and what is allowed to be exhibited. Zhao and Lindley (2014) note, "Curation for exhibition is different to curation for archiving." However, earlier forms of personal records—letters, diaries, and photographs—also embodied aspects of performance and exhibition [28, 51, 71]. Good [28] notes the similarities between Facebook and scrapbooking around "documenting friendship, navigating new media abundance, and communicating taste and building cultural capital." Content in scrapbooks documented friendships and often included clippings selected by friends or were even written in by friends. Good argues that scrapbookers were "perhaps not always as archive-minded as we see them today." Rather, scrapbooks "played a number of immediate, social roles for their owners," just like social media websites do for users today [28].

Transitioning from material to digital artifacts can be challenging; emerging considerations around attachment, function, symbolism, and material qualities all impact people's decisions to preserve or discard [30, 55]. The practice of organizing documents for a future self, or "personal information management," is a personal archiving practice that involves folders, searching, and sorting [82]. Whittaker et al. propose machine learning techniques to help streamline people's organization of their information [82].

Kaye et al.'s study of academics' work practices describes a "legacy archive" as one that is a testament to the subject's life work [39]. The concept of a legacy archive may be also introduced as a testament to one's life. Extensive scholarship in computer-supported coooperative work (CSCW) and computer mediated communication has documented self-presentation goals as in the present [70, 81] but less research has focused on self-presentation goals for the future, indicating an opportunity for more work.

The evolution of personal information management (PIM) highlights the ways in which computing and archival disciplines have evolved in temporally parallel but disciplinarily disparate paths. In the 1970s, PIM emerged (via a 1973 Arpanet working group meeting [17] while archivists were resurfacing the importance of provenance—understanding where the record came from [14]. Both fields acknowledged that people's things have value now and in the future, and that better systems are needed to preserve and make those things available. However, unlike archival theory, PIM originates from a work environment where productivity was bolstered by the use of technology—for example, saving and finding work emails for later use [76]. As a result, computing has defined PIM as the practices of organizing pertinent information so that it can be retrieved for future use [76] whereas archivists have focused on the personal archive as primarily about building a legacy, constructing and memorializing identity, framing the family, and guarding against loss [39, 41, 44]. Social media data archives have been depicted as "developer stewards" that preserve culturally significant data from social media platforms, a premise we build on this work [2].

2.3 Life Transitions and Values

Prior work in has explored how younger adults—e.g., new mothers and college-going young adults—think about the long-term value of their personal digital records [42, 70, 80]. Scholars

have also examined how parents think about their legacy when reflecting on inherited objects and objects to be passed down in the future [30]. We conducted our empirical investigation with adults in the 50's to 70s age range because they are—or will soon be—experiencing decisions about what to keep, what to get rid of, how, and when, all decisions vital to theory and practice in archival studies [35, 51, 61, 62, 71]. We build on extensive prior work on aging, memory, and legacy that explores how older adults prioritize objects that allow them to reminisce, such as photos. As adults enter the broad life stage of older adulthood, several life transitions may take place, such as moving from full-time work to retirement, becoming "empty nesters," or moving from a house to an apartment, independent living facility, or an assisted living facility. To counter the stigmatization and mistreatment that can come with such transitions, the concept of "aging in place" has taken hold, which advocates for living safely and comfortably in one's own home. Lindley and Wallace (2015) propose the concept of "placing in age" to describe how older adults seek comfort and control after a move [43]. They take a future-facing perspective that frames a move later in life as positive and proactive [43]. In this light, new technologies can also be overly simplistic for the nuanced and asymmetric experiences of older adulthood [45].

The experience of aging involves transmission of material possessions (via giving away, selling, passing on, or destroying) and of legacies (including those that are biological, material, or values) [19, 20, 38, 44]. Media, primarily print photographs, are of central importance to intergenerational relationships and recordkeeping [11, 36, 42, 68, 83]. However, digital content is not yet easily shared or co-owned [12, 29, 60], though some online platforms (e.g., Facebook, Dropbox) are adding features such as group photo repositories. Facebook has also implemented "Legacy Contact," which enables users to designate a steward to manage their accounts after death [7]. One study suggested that older adults are less likely to value their digital possessions as compared to their material possessions, perhaps because they formed a sense of identity through their material possessions before their digital possessions ever existed [21]. Older adults have also been slower to adopt social media due to their concerns about safety, age appropriateness, time commitment, content irrelevancy, privacy, and negativity [5, 21, 37]. However, their rate of adoption is growing: from 2000 to 2016, the percent of seniors who went online grew from 14% to 67% [10].

Older adults seek communication technologies that are lightweight [45], have the potential to offset the loss of relationship, prevent isolation, and increase self-esteem, especially for those living alone at home [3]. Technology adoption by older adults hinges upon their "intention to learn," which requires that their peers are also joining, having a sense of self-efficacy to do so, and feeling "ready" to convert [75]. Brewer and Piper [5] note that older bloggers engage in self-expression and identity exploration online, and generally refute the idea that identity formation has ceased in older adults. We center values of agency, dignity, and control to examine how older adults can be archivists of their own data, framing our participants as both capable of, and having the right to, cultivate their own archives.

In this work, we build on archival appraisal theory as a foundation to explore personal data stewardship principles that apprize data and its management as instruments of power, control, subjectivity, and emotion. We seek to bring theory and practice to the management of data that is captured with or without people's knowledge or consent, and stored "in perpetuity" for profit without regard for the archival values represented in that data. We bridge archival theory with qualitative interview data from adults in life transition stages to consider alternative approaches to data management practice in computing. Our empirical study relies on a theory-driven inductive approach [47], in which we began by generating questions derived from our interpretation of archival theory and then analyze our data with that theory as a guiding framework.

3 METHOD

We conducted an interview study with 17 adults from two U.S. cities, one medium-sized city in the Midwest and one large city in the Northeast. Participants were between the ages of 51 and 72 (median 65.5). We recruited participants via Craigslist and via flyers posted in public spaces including farmers markets, grocery stores, public libraries, and senior centers. Recruitment messages contained a local phone number (for flyers) and a phone number and email (for online recruitment). The only screening was participant age—we sought participants who self-defined as "older adults." We gave a general range of 55 and older, though we acknowledge that biological age may be biased. We recruited participants until we reached saturation, with few new themes in participants' responses by the final interviews. We gave participants the option of conducting the study in a location of their preference. We suggested their home, our office, or a room in the public library to allow them to choose a location that felt comfortable for them. Two members of the research team conducted interviews at participants' homes (n=4), the research team's workplace (n=2), semi-public meeting areas (n=2), and private rooms in public libraries (n=10). We summarize participant demographics in Table 1 to contextualize the results. We note that our sample reflects a convenience sample from the two cities where the researchers were located which had some diversity in terms of race and socioeconomic status but no rural representation. All participants identified as male and female; our sample did not reflect gender diversity. Our sample was also overeducated relative to the population in the US, and therefore likely also a higher socioeconomic status. We did not ask about disability status.

The Institutional Research Board at the authors' institution determined that this research was exempt. At the beginning of the interview, we explained the consent form to participants and walked them through each section. We gave participants a copy of the consent form. We then asked participants if we could audio record them; when given permission, we turned on the recorder and began the interview. Interviews ranged from 49 to 89 minutes (median=61). Participants received $25 cash at the conclusion of the interview.

The interview began with warm-up questions about family, friendships, and daily life. The first set of questions was about remembering: what were memorable moments, people who were important, and things of value. We also asked participants what they thought having a legacy meant and what they thought would represent their legacy. The next set of questions was about forgetting, such as: what things have you gotten rid of or actively destroyed? Are there moments of your life you wish you could forget? Are there people you wish you could forget? The third section asked about technology and social media use and attitudes. The fourth section asked who should own personal information, and specifically probed attitudes about corporations or the U.S. government owning personal information. The final section asked remaining demographic questions.

The research team developed the codebook iteratively through multiple readings of the transcripts. Our coding process was both deductive and inductive, drawing from archival theory as well as data from the interviews. We revised the codebook iteratively via discussions and revisiting of transcripts. When we reached a first draft of a complete codebook, two members of the research team coded one transcript using question and response pairs as the coding unit. They then met to refine the codebook and reconcile coding ambiguities [78]. The final codebook contained 39 codes associated with preservation practices, social media use, and aging. Examples of these codes were: keeping, destroying or getting rid of, legacy, family, friends, social media use, technology use, privacy, and assessing value. Two members of the research team then coded the entire dataset of transcripts with every transcript receiving a coding pass by both coders. We observed differences and similarities in the transcripts using a constant comparative approach [78]. We synthesized codes and used archival theory as a guide to develop themes iteratively throughout analysis.

Table 1. Participant Demographics

	Gender	Age	Degree*	Employment
P1	F	72	Bachelors	Retired
P2	F	65	Bachelors	Retired
P3	M	64	Masters	Working
P4	M	59	Bachelors	Working
P5	F	65	Bachelors	Retired/Unemployed
P6	F	56	Some College	Working
P7	F	68	Masters	Working
P8	F	66	Some College	Unemployed
P9	M	66	Associates	Unemployed/Retired
P10	F	66	Bachelors	Unemployed
P11	F	60	Associates	Working
P12	F	51	PhD	Retired
P13	F	55	Some college	Retired
P14	M	70	Bachelors	Retired
P15	M	67	Masters	Retired
P16	F	76	Masters	Retired
P17	M	56	Masters	Working

4 RESULTS

We structure results around three open questions that archival appraisal theory brings to the table: What kinds of data should be kept? How long should data be saved? Who should decide what constitutes the archive? We draw on quotes from participant interviews to illustrate the rich and distinct values that guide preservation preferences. Our participants have somewhat diverse backgrounds in terms of socioeconomic status, race, relationships, and culture; we do not aim to synthesize their stories into a single narrative or set of archival priorities, but instead to illustrate how values can be encoded in digital data, and how those data represent broader narratives of control and power.

4.1 Data as Legacy

In terms of the nature of the personal data that someone should save, participants showed a strong preference for documenting their impact on the immediate world around them and influencing the memories of this impact into the future. Participants in our cohort, which may roughly represent the perspectives of an aging "Baby Boom" generation, were acutely aware of their legacy and the evidence that might cement their memories in the lives of others.

One major theme that emerged from our interviews centers on affect—participants in the study want to be remembered as kind and caring people. P5 captured this in her comment:

I would like to be known for how I made people feel. I took care of people, helped people. More so than probably fortune or fame or that I made a gazillion dollars or something. I think I'd want a legacy that I cared about people deeply.

P6 said that she wanted to be thought of as a kind, good-hearted person towards other people, a sentiment shared by P12, who said that the most important thing is kindness. P7 wanted to leave behind people who will make a difference on a person-to-person level, people who bear kindness and compassion. P15 and 16 desired to be "compassionate" and "caring," respectively. Some participants described ways they might instantiate these values: P3 was involved in social work, P8

adopted out animals to families, and P4 had mentored youth. However, none of our participants felt that their digital data, such as personal files or social media profiles, currently did the work of reflecting their legacy. While they recognized social media's value for connecting with family and friends, they did not perceive it to act as an archive of their life.

A second major theme that emerged from participant interviews is the importance of memorializing the values that participants convey to their family members. For participants who reported having children or grandchildren, their legacy is their family and the values that they passed across generations. In this regard, evidence from the past that is carried to the present becomes a mechanism for influencing the memories of others in the future. Participants would privilege evidence—physical or digital formats—that documents these generational connections.

As P4 said:

Well, I think that family values, if I was to have a legacy, it would be definitely [that I was] a family man.

P3 similarly expressed this desire:

Probably the most important legacy that I'm leaving is having children, who are if I may brag for a moment, bright and interesting people. People who are contributing in significant ways.

P13's hoped that her value of kindness was passed on to her son. Though P2 did not have children of her own, she had passed on recipes to her grandnieces and nephews and teaching them to cook was their shared activity: *"It's just the thing that we do. Those are my legacies."*

In addition to affect and family, a few participants surfaced a third theme around the evidence of creative endeavors as a component of their legacy. P3 made music and noted that he had a sign in his music studio with an Oliver Wendell Holmes quote that said, "Too many people die with the music still in them." P11 wanted her legacy to be helping people draw on music and art to tap into their emotions.

"I don't expect too many people to attend my funeral or remember me. I don't know."

Participants reflected on the material properties of objects that offered archival value for ensuring a personal legacy. A few mentioned they had objects that carried value to be passed on, most invoked photographs as records of memories. Only a few of the 17 participants placed archival value on physical prints. Instead, most participants expressed their belief in the long-term survival of digital photographs, because they could so easily be saved, stored, and duplicated, thus rendering the physical artifact of little material value.

P7: Well, in the world of digital, I've got most of that. I've got the stuff on my iPad, on my laptop, so I can call it up like that. My vacations, all the stuff where I used to have albums, now I've got all that stuff online. If there were a fire, even the photographs are not that much of a concern because I either have them online or my children have copies of them and I've given most of the photographs, the family albums from the children's childhoods, I've already given that to them.

One participant noted that the common practice of online photo sharing among family members absolved her from responsibility for doing the work of creating the visual records or saving them herself:

I don't even take pictures any more. There are so many pictures on Facebook. I follow my family on Facebook and I know somebody else is going to have the pictures, so I don't have to sort through them and keep them. We went to a family wedding again the other day, and everybody's with their cameras and stuff. I said, "Well, just text me that one or I'll look at Facebook." I don't worry about capturing images, because they're everywhere. –P2

The participants in the study were widely invested in the sharing and communication capabilities of Facebook without a particular consideration of the long-term availability of Facebook content. Many participants also reported using word processed documents and email utilities to save important memorializing information to share among family members, friends, and close associates.

Among participants, the urge to share data that could contribute to the lodging of a personal legacy is more ubiquitous than the urge to save such data in a personal archive. This finding suggests implications around delegating the urge to save to social media platforms with little incentive to treat contributed content as archival evidence.

4.2   Precarity and Forgetting

The formal literature on archival appraisal in the post-modern context conveys an acute awareness that absences in the archive are as salient as the constructed evidence that survives. One particularly clear narrative emerging from our study is the extent to which the stories that participants tell about the long-term persistence of the archive is deeply related to their experiences of stability—periods when they had jobs, a partner or friends, and a place to live—contrasted with experiences of precarity—when they were lacking some or all these things. Participants connected those experiences to their attitudes about what was of value to them or not as they aged. Five participants said they had actively destroyed physical or material items in the past, all of which were related to relationship breakups. These ranged from clothes to albums to a guitar to: "In a fit of anger I ripped up my marriage license."

When asked to consider what moments they might like to forget, most participants described experiences and relationships that were heavily loaded with negative affect:

I wish I could forget all that pain I had after breaking up with [ex-girlfriend]. I just didn't know how to let go of something. –P14

Probably when I had to tell my son his father had passed away, and then also when I had to tell my brother, because my mother couldn't, that our father passed away. That's probably a given. When I hurt somebody's feelings by what I had said… -P13

Keep anything from my childhood? I wouldn't want to save anything. All of the taunting and stuff; that was all public, so people all heard it. It wasn't anything that nobody else heard. Yeah, there would be none. –P2

The experience of relationship dissolution was a common predictor of a desire to forget, or at least, a lack of interest in remembering. As a result, participants who experienced these life disruptions carried a certain kind of detachment from things they might have otherwise valued. For example, P1 said she did not worry about things being broken or stolen:

The experience, again, of the divorce and losing most of the belongings that I really, really cared about did gave me a certain separation from things.

P6 noted that after her divorce she was *"just learning a lot about myself. I don't want to save anything, do I?"* P4 expressed a similar sentiment:

It was always easy for me to let go of things. I think a large part of that had to do with when I went through my divorce. Like I said, I lost my job. I lost my mom. I went from a $70,000 a year job to $20,000 a year. No more company car. I had to let go of a lot. I had a house built from the ground up [that] I left with my wife and my children.

Yet when asked whether they would forget the person themselves, participants overwhelmingly reported that no, they would not forget the person:

I don't think so. Yeah, like as I said, as I'm getting older, maybe I'm getting wiser where no one has a perfect life. Things happen, and most of the things that have happened to me, I'm responsible for. Maybe right now I'm just kind of living in the day, so okay, that's my life. That's what happened to me. I would say I don't think there's anyone. –P6

No. I would say, in all honesty, no. Even though I might have experienced our interactions as unpleasant, I do believe things happen for a reason. –P12

No, not really. No, I'm a pretty good person, and I forgive a lot, an optimist and all that stuff. –P11

In contrast, among participants who had been married for a long time (all of our married participants happened to also have children) valued certain objects for the passing of lineage over time:

The kids, they don't want the silverware, they don't want the dishes, the glassware… The one exception is the sofa, which belonged to my grandmother. There are times when I would like to get rid of it, but it belonged to my grandmother and I've had since she died in, I think, about 1966. –P1

These participants generally pointed to one or two items or collections they cherished—art, dolls, musical instruments—that they hoped might live beyond them.

Many of our participants had experienced demanding and compounding life challenges, including sexual abuse, homelessness, prison, and financial insecurity. Some had reached a point of greater stability at the time we interviewed them; others remained in a precarious state. For example, P8 said "survival" was her primary concern at the time of the interview. She was living off her social security and had a house that "isn't worth anything" but otherwise had sold off her possessions piece by piece to survive:

There are some pieces that are harder to lose than others… The thing that frustrates me is when you take something that meant a lot to you and you sell it and then it goes for a little bit of groceries which are gone in the toilet the next day, that's frustrating. The thing had more value to me than the food… -P8

P13 was living in her car at the time of the interview and therefore valued "everything" in her home at that time. P9 questioned whether poor people have legacies, but then shared his:

What legacy? Poor people don't have legacies, do they? My name is [spells last name]. It's pronounced [pronounces]. My legacy is that my youngest son has my last name. I grew up where family names are… your heritage is important. I hope he has some boys and regardless if he marries the woman or not, that they can come to an agreement that their last name's going to be [last name]. That'd be my legacy. I have nothing to give my sons when I die. I have nothing to give my grandson when I die. I have nothing, but a name, memories, so that's going to be my legacy. -P9

P9 had now lived in the same place for nine years, the longest in his adult life, but described how his youthful material possessions—he owned a fancy car in his 20s—no longer mattered:

I was a [sic] addict, I was a addict raising a son, so it's not that I was getting evicted, but when I had to move for whatever reason, I wasn't putting things in storage. It was just, it's extra baggage. It's no way I can deal with it, so in my mind, it's just better to take my son and go out there and do what I need to do and start over. -P9

To destroy is to purge. With both relational and economic precarity, participants had experienced loss of objects and memories for many decades by the time of the interview and had developed detachment from experiences and memories over time. For these participants the long-term survival of the personal archive is the antithesis of their survival. Life affirmation comes not only with abandoning the circumstances of precarity but also with creating the silences that in some ways only the disposal of personal archival evidence can provide. For those participants with more stability, on the other hand, the life stage of late middle age brings with it thoughts about what to do with the objects they consider meaningful, recognizing that in many cases their children and friends might have no use for them.

4.3 Aligning Institutional and Personal Archival Practice

Recent scholarship on archival appraisal theory is most compelling in highlighting the complexities of agency and control over the power to shape the archive over time. When asked about the control that they may exercise over their data, most participants reflected primarily on the content they created themselves or shared explicitly through social media, photo sharing sites, or email. Most participants were less conscientious of other kinds of data about their actions, such as voice data

or mobile phone data, that is in fact collected and stored with neither transparency nor explicit approval.

When asked if government agencies should play a role in preserving their personal records, participants were overwhelmingly opposed to the idea. Many responded with comments like *"definitely not," "it's not their job,"* and *"it's a waste of tax dollars."* P6 said she had nothing to hide and P9 noted that while authorities were using social media to catch child molesters and runaway girls, what was stored in his phone should be *"private between him and the phone company."* Participants' views on companies preserving personal records for them were more varied. Many participants noted the usefulness of being able to choose and then entrust a company with data:

If we're paying a company to do that, I asked them to do that. I think that's not a bad idea, to be able to take your pictures and put them there if there's a safe place to put them. I went to a seminar on de-cluttering, and that's what this woman suggested, scanning stuff in and backing it up to the cloud. You don't have to have the actual pictures cluttering up your house. -P2

Others appreciated the convenience of digital storage and sharing:

I think of it in some ways as journaling. I don't keep a journal, a written journal, myself, but when Facebook shows me memories from five years ago or seven years ago or something like that, I appreciate them. —P1

Participants were cognizant of privacy risks concerning transferring personal records to a company. Some noted that companies selling personal data to advertisers was an inevitability. Some also perceived no end date to how long digital data might be held by companies. P1 believed that companies like Facebook keep data and "use it to sell ads" and when asked how long they keep data, replied "forever." P16 also articulated how data might be saved forever, though she did not have the power to decide that:

How long is it going to be saved? I don't know that I have that power to say because I would think in the archives of technology it could be saved forever, but I think ... I don't know... I like to have control too. It's a control issue. I've got companies and organizations and I don't need to share my information with everybody.

Another participant noted that she tried to leave Facebook because of privacy concerns, but she eventually came back because her family was on the platform and documenting life histories was easiest to do there.

I had Facebook, but I didn't like it because I found it wasn't as private as I thought it was, so I got away from it and actually thought I had discontinued it. Now, they found me, and they're acting like I still have this account open. I went, "Oh, okay. Let me see what can I do with email?" Now, the legacy thing you were asking me about, I'm trying to do it through Facebook. —P11

P4 preferred to store his personal data on his own storage devices. He explained that companies would not be custodians of personal records without an incentive:

[They're not going to say] "hey, I'm going to just help you out and I'm going to take care of your stuff for you." That's not the way the world works.

P13 said she did not trust Facebook and would use it only if she could be "incognito" by using a fake name. This insight belies the fundamental truth-value assumption of Facebook and other non-anonymous social media platforms that establish one "real name" as the foundation of trust [31].

P16 thought that companies keeping personal photos would be an "intrusion"—companies would have to have a good reason to request them. P6 used Facebook but believed that deleted data was never actually deleted:

5 DISCUSSION

Our results surface priorities that our late middle-aged interview participants have regarding the archival nature of their legacies, the value of keeping versus destroying evidence pertaining to that legacy, and the complexities of dealing with ownership and control of their personal data. People are readily embracing the power of digital data to document their lives and to share with those around them the evidence of their personal and creative impact. Our research is a small indicator of a growing disconnect between what people think a personal archive is, on the one hand, and what happens to the pieces of that digital archive when agency and control are dispersed and distributed across technology platforms. Postmodern archival theory recognizes that the archivist and archival processes are subjective and that presence and absence in the archive are manifestations of latent power and control.

Our results indicate that duration is an important criterion for archiving personal data—not all data should be saved, nor should it be saved forever. Archival theory brings four proposals to the table: 1) people should be able to dictate the duration that data about them is saved; 2) theory that combines institutional and personal archival practices as a collective practice is needed; 3) preservation as a default affordance among technology companies is not a neutral decision; 4) visibility and oversight is needed for companies that are gaining immense power over how and what individual and societal memories and values are preserved. However, our study reflected a narrow sample of participants, and could be extended to consider more diverse narratives. It may also be that other methods like cultural probes or diary studies could elicit deeper insights into values over time. Technology design privileges in-the-moment judgements whereby likes and up-voting serve as proxies for value; a long-term perspective might explore new ways of supporting personal legacies, affect, and values over the lifespan of an individual.

Although the participants in our study may see little value in their personal data for anyone but themselves, an archival perspective recognizes that building a personal archive involves decisions about what is and is not important, who can and cannot participate in the archive, and how the cumulative presence of the archive influences knowledge structures. As the personal archive migrates beyond the control of the individual creator, the wider context within which the archive lives becomes increasingly important. As the archival theorist Terry Eastwood has noted, "the larger context of the event and the context of the interpreter's use of the document leave ample room to complicate what truth can be derived from the document" [24]. Here, we can begin to see how technology companies like Dropbox, Twitter, and Facebook are shaping social memory practices through their affordances and design choices. From an archival perspective, these companies have already become the recordkeepers of social knowledge.

The desire of our study's participants to forget the pain of bad relationships, while remembering the individuals themselves, creates fault lines in the simplistic, binary practice of storing data or deleting it. Archivists have argued that records are "socially constructed entities created for reasons far from impartial and by procedures often inauthentic and very cognizant of posterity" [72]. Our informants may be unsophisticated as formal archivists, but nonetheless reflective about how their personal archival records constitute part of a socially constructed legacy they wish to pass on to future generations. Prior work has found that people do not want to exhaustively preserve digital records, but instead want to reconstruct their past from carefully selected cues, using both digital and physical materials [59].

The rich theory of the postmodern archive, and the complexities of appraising the value of what is and is not in the archive, sheds light on the disconnect between the desire to endow digital artifacts with the power of memory and the personal agency needed to guarantee that legacy persists. Archival scholars note that technological innovation has "created an expectation of democratic

recordkeeping and expanded horizons for cultural memory" [66]. However, across various social and cultural contexts, archives have functioned as battlegrounds of narratives, memory, and power [72]. While archival appraisal theory originally may have posited the archivist as a facilitator beholden to the virtuous ideal of cultural memory for the benefit of future generations, in practice, archives "are established by the powerful to protect and enhance their position in society" [72]. This insight holds true for the well-established corporate data control structures in today's large technology platforms.

Technology companies pressure themselves to tell the story of their neutrality, especially on such controversial issues as privacy controls or political agency (e.g. [79]). We see employees at technology companies exerting the power of archivists, and technology companies serving as de facto personal archives through their accession and retention of people's digital data. The owners of these online social media-oriented archives assume the mantle of the archive, however, without the cultural or professional mandate to create a public good. By deferring or obscuring the importance of appraising their acquired digital archives for long-term preservation, corporate data entities have assumed the power to archive without accepting the responsibility to protect the legacies, memories, and stories that individual users have delegated to them. By framing the archival process as a neutral and objective mechanism for storing data, computing overlooks archives as sources of power and control of individual and collective memory [72].

When designing systems that keep records—whether in the computing or the archival tradition—the people who make decisions about what personal data to acquire and keep have immense power to create and shape social identities and histories [72]. This agency includes influence over the ways in which society identifies its core values and how transparency serves to promote accountability and dialogue within a community. Our participants come from diverse backgrounds and have experienced precarity and loss. Their stories and cultural values indicated varied priorities for saving the evidence of their lives, such as a last name or a recipe, that may not align with a Silicon Valley culture, as represented by companies like Google, Facebook, or Twitter, that values identity as a marketing object [31]. The affective dimensions of traumatic events and everyday life have historically been omitted from official records. And yet, under the influence of postmodern archival theory, archival practices have shifted toward actively centering those feelings, including as a means to reveal the structural injustices dealt to marginalized individuals [9, 13]. Incorporating emotion in archival processes thus enables archives to tell a fuller story about the social experiences of individuals and groups in important cultural moments.

Rogers argues that a goal of scholarship should be to produce theories that can be used beyond just the people suggesting them [67]. Rogers suggests that one of the main benefits of applying theories from other fields is to help identify factors relevant to the design and evaluation of interactive products. Archival theories propelling an understanding of the archive in the 21st century are a natural fit with computing scholarship. CSCW researchers generally subscribe to the belief, articulated by Pinch and Bijker [63], that technological systems are socially constructed. Archivists share this belief, arguing that archives, and the ideas, feelings, actions, and transactions embedded in them, are social constructs. "The choice of what to record and the decision over what to preserve, and thereby privilege, occur within socially constructed, but now naturalized frameworks that determine the significance of what becomes archives" [72]. We argue that archival theory adopted in computing can be both explanatory—it explains a set of processes—and generative—it enables practitioners to discover new ways of looking at design. At its outset, appraisal theory conceptualized archivists as individuals who preserve a cohesive and representative set of documents, so that future generations may judge and understand society clearly. Yet individual lives are often full of discontinuities, absences, and a distinct lack of cohesion. Our participants indicated that many parts of their lives bore experiences that they did not want to preserve. While object loss or irrelevance can invoke

negative connotations, archivists recognize that objects must be subject to decisions about whether they should be preserved or destroyed. "If records are appraised as less valuable than others, they may never be archived and effectively forgotten, even erased, from institutional or public memory" [66].

6 CONCLUSION

The field of computing has adopted the concept of "the archive" as a place for storing digital records that may be no longer needed for active use. Our results indicate how data can be a form of legacy, particularly when encoded with individual values, such as emotions and relationships. Our research also reminds us that not all personal data can or should be saved, and in fact, some records should be deleted with full recognition that loss can itself be a social benefit. We have argued that computing can benefit from a deeper understanding of archival theory, which in its postmodern construction enlightens sociocultural dimensions of the presence and absence of personal data. Archival appraisal theory, in particular, offers a roadmap for preserving data based on a nuanced understanding of multiple values and the terms of archival protection mindful that the values embedded in the archive are distributed widely rather than concentrated in the archivist. Technology companies and the people who work at them, in assuming (purposefully or not) the role of the archive have similar power over personal and cultural legacy and memory.

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