

Behold the once and future me: Online identity after the end of a romantic relationship

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After a romantic relationship ends, individuals are left to deal with the digital remnants of the relationship. These possessions and connections pose difficulties for users – they are identity markers of an identity that one may no longer want legible to their online audiences. Further, they can cause upsetting moments that might impede moving on from the break-up.

Through interviews with 11 women who had had a recent break-up, this empirical study examined how people managed their online identity after their break-up. We found that people took different actions towards their possessions and connections in service of creating a post-break-up identity. Using Brubaker & Hayes's (2011) representational framework, we find users attempting to deal with connections as if they were possessions, creating tensions that our current systems are ill-suited to address. Turning to Hogan's (2010) framework of the online identity 'exhibition', we see users creating exhibitions for an audience of one – themselves – while also making decisions about who is allowed to see their public-facing exhibitions. We conclude by arguing that existing tools are ill-designed to support competing desires to present authentic past and future online identities and offer design suggestions for consideration.

CCS Concepts: • **Human-centered computing** → **Empirical studies in collaborative and social computing**; *Social networks*; Social networking sites.

Additional Key Words and Phrases: relationship dissolution; life transitions; digital identity; social media; empirical work

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1 INTRODUCTION

Experiencing the end of a romantic relationship – a break-up – can be an emotionally fraught moment in one's life. A break-up represents two people disentangling their lives, and re-conceptualizing their identities in relation to each other as less of a "we" and more of a "me" [49]. As part of disentangling, the two ex-partners may face decisions around who gets various physical objects that were once considered jointly owned in the context of the relationship. For example, when a cohabiting relationship ends, "Who gets the couch?" and "Who gets the cat?" can be difficult decisions to make.

In addition to decisions made around the physical remnants of an ended romantic relationship, a break-up also requires consideration of the various relationships that sprung up around and

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because of a romantic relationship. If decisions around who gets the cat need to be made, so too do decisions around who “gets” a particular friend [1].

With the advent of social media, our relationships with others, romantic or not, are now represented by data on social media sites (SMSs). In addition to decisions about physical objects and relationships that remain after a break-up, two ex-partners might have to make decisions around the digital equivalents – the pictures, posts, and encoded connections to others that exist past the end of the romantic relationship [36].

The digital possessions (*e.g.*, photos, posts) and connections (*e.g.*, Friends on Facebook, followers on Instagram) present challenges that their offline equivalents do not – they are available to be viewed at any time by others online [10]. The possible audiences include the algorithms that drive suggestion and reminiscence systems [20]. Thus, managing these digital remnants after a romantic relationship ends is now an important consideration after a break-up [45, 46, 74], and can help protect oneself from upsetting moments [78] while recovering and growing from a break-up.

In this paper, we investigated how people handled the digital remnants – their possessions and connections – in the wake of experiencing a break-up. Through analysis of interviews with 11 people who have recently gone through a break-up, we identify differences in how they managed the offline and online remnants of their relationship and how the online connections presented challenges that possessions did not.

Turning to conceptual frameworks of identity exhibition [48] and representation in digital environments [2, 14], we see our participants contending with challenges created in part by the limitations of translating deep, human experiences into machine-readable data. Extending Hogan’s framework, we saw our participants acting as curators of their online identity exhibitions, taking action on their possessions and connections based on one of two curatorial philosophies – that of the archivist or the revisionist. Their curatorial practices resulted in multiple exhibitions aimed toward different audiences, including exhibitions aimed at audiences of one – the participants themselves.

Leveraging our analysis, we offer implications for SMS designers when creating features that act upon digital possessions and connections, and highlight how our extension of the exhibition framework may offer utility for research focusing on other types of life transitions. Specifically, we position the individual as the exhibit but also as a curator and as an audience. Positioning the individual in multiple roles simultaneously may offer interesting insights into how users consider their self-presentation goals and work within systems to achieve those goals during and after a life transition.

2 RELATED WORK

To situate our work, we begin by examining work on the impact of sociotechnical systems on individuals going through life transitions. We then turn to romantic break-ups, a specific type of life transition. We discuss work from related disciplines focused on how break-ups occur offline, and then discuss more recent work from human-computer interaction (HCI) about how break-ups are represented in online environments. Finally, we discuss online identity and representations of identity, introducing Hogan’s [48] identity exhibition. We use the framework of identity exhibitions in our discussion as a lens through which to understand our participants’ experiences in formulating a post-break-up identity.

2.1 Life Transitions

Over the past decade, and particularly since 2015, HCI researchers have focused more attention on understanding life transitions. Particularly, researchers have paid close attention to understanding how social technologies help and hinder individuals going through life transitions.

Life transitions encompass a variety of lived experiences. Researchers have studied death and dying (e.g., [15]) transitions from childhood to adulthood (e.g., [23, 75, 94]), gaining or losing employment (e.g., [16, 25]), entering or leaving the armed forces (e.g., [26, 92, 93]), losing a pregnancy (e.g., [3]), and coming out as queer or trans (e.g., [41, 42, 79]). Across this variety of human experiences, work has highlighted the utility of sociotechnical systems during these moments of transition. For example, Burke & Kraut [16] found that social sharing with strong ties causes more stress in the aftermath of a job loss, but simultaneously provides more opportunities for finding new employment. Elsewhere, Haimson [40] argued that social transition machinery enables people to move through life transitions (drawing on van Gennep's liminality framework). Through this framing, Haimson argues that social media provides the means that enable life transitions and that multiple platforms present multiple identities that enable an individual to move through those transitions [40].

Social technologies simultaneously present challenges to people going through life transitions. For instance, decisions around coming out can be complicated for trans individuals, who have to navigate when, where, and who to come out to online. Decisions around coming out, or disclosing other types of life transitions, can lead to instances of context collapse, where audience members see posts or other digital artifacts not meant for them to see [65]. While context collapse is potentially problematic for any user (for instance, having a family member see a photo from a college party is likely to be awkward for anyone), it can be especially problematic for trans individuals [79]. While seeing a photo from a college party is awkward, it likely does not come loaded with the possibility of harassment or rejection. In contrast, a coming-out post seen by homophobic or transphobic relatives might lead to emotional abuse or physical danger.

A specific type of life transition that could be complicated by how it is represented in online systems like social media is the dissolution of a romantic relationship – a break-up. Next, we describe prior work from a variety of disciplines focused on how relationships end offline.

2.2 Romantic Relationships and Break-ups

Understanding how and why romantic relationships end has long been a focus of research from many disciplines. Researchers from psychology (e.g., [19, 59]), neuroscience (e.g., [76]), and social work and therapy (e.g., [73]) have investigated relationship dissolution and its effect on individuals. Work across these disciplines has focused on three specific facets of a break-up – why people break up, how they break up, and what happens after a break-up.

Baxter [8] identified eight different reasons people break up: a desire for more autonomy, a lack of shared interests or character traits, a lack of support, a lack of openness, a lack of loyalty, a lack of time spent together, a lack of fairness, or a lack of romance. Even when these reasons are present, however, couples do not always break up. Rhoades, Stanley, and Marman [81] found three reasons that might influence whether a couple will choose to dissolve their relationship. These reasons were characterized as perceived (e.g., social pressure to stay together), material (e.g., sharing property such as a lease), and felt (e.g., feeling trapped). Rhoades et al. also argued that dedication – interpersonal commitment – might be a fourth reason for staying with a partner or ending a relationship. Other factors that contributed to relationship continuance were length of relationship or age of the relationship participants (e.g., [27, 56, 91]).

Turning to literature on how people break up, researchers have proposed several models of relationship dissolution (e.g., [7, 28, 39, 54, 60, 84]). Duck's initial relationship dissolution model identified four stages of relationship dissolution – intrapsychic, dyadic, social, and grave-dressing [28]. In the intrapsychic stage, each partner independently assesses the relationship and alternatives. When private thoughts become public, the couple has moved into the dyadic stage, where they will consider both relationship repairing and dissolving behaviors. When the decision to end the

relationship has been finalized, the couple moves to the social phase where they come to terms with the societal repercussions of separating. Finally, in the grave-dressing stage, the individuals come to terms with the break-up and begin to search for understanding about why the relationship did not last [28]. Later work argued for a fifth stage, resurrection, in which individuals consider how to apply the lessons learned to future relationships [84]. Communications scholars have taken Duck's model and applied it to Facebook and other SMSs, finding that behaviors online map onto the dissolution model and can amplify some stages of the model [58].

In contrast to Duck's relationship dissolution model, Baxter's process theory of relationship trajectories [7] identified six features of relationship dissolution, represented as a flow chart. The features are: the gradual versus sudden onset of relationship problems; the unilateral versus bilateral desire to end the relationship; the use of direct versus indirect actions to accomplish the dissolution; the rapid versus protracted nature of the dissolution "negotiation"; the presence versus absence of relationship repair attempts; and the final outcome of the process – relationship continuation versus dissolution [7]. What Baxter presents as a complication process is reduced in sociotechnical systems to a few clicks to sever the connection between two accounts (e.g., "In a Relationship" on Facebook) and delete or archive possessions like pictures and posts of significant moments from the relationship.

The third widely discussed model of relationship dissolution posits that relationships end when the costs of staying in the relationship are greater than the benefits [54, 60]. Derived from interdependence and social exchange theories (see [87]), this model suggests that people assess their expectations and compare them between their current situation and available (or perceived) alternatives [54]. When an alternative is evaluated more highly than the current relationship, individuals will leave the relationship in favor of the alternative.

Noting the sequential nature of Duck's model as well as other models (e.g., [7, 54, 60]), Battaglia et al. [6] invoked the concept of dating scripts (e.g., [85, 86]) to identify "break-up scripts." They identified 16 steps that people went through after deciding to break up. The break-up script is cyclic (for example, steps 1 and 6 are both "lack of interest"), exhibiting an approach-avoidance pattern of conflict behavior [70]. Approach-avoidance patterns reflect internal indecision that is outwardly portrayed as oscillation or "vacillation" between desiring different possible outcomes. The oscillation comes to an end when the goal (here, breaking up) is achieved. As we discuss in Section 2.3 below, the representation of our relationships in online spaces can complicate the break-up script that dissolving relationships might otherwise adhere to offline.

Once a break-up has been achieved and a relationship ended, researchers have identified several practices people undertake in response. While some practices are helpful in encouraging self-growth or transformation (e.g., [96]) others have been shown to be harmful or delay healing post-break-up (e.g., [9]). For instance, Marshall et al. [64] found that ruminating on a break-up can encourage self-growth in the aftermath of a break-up, while multiple scholars have shown that physical space can in turn help with emotional healing (e.g., [22, 67]).

Other work has focused on examining the length of time it takes to heal or "move on" from a relationship. Here, researchers have found that recovery depends strongly on individual factors (e.g., [82]) and can vary in length depending on those factors between 3 and 17 months [61]. However, the advent of social media has complicated the ability to get space from an ex, people close to an ex, or possessions that remind one of an ex, which in turn can complicate break-up recovery.

2.3 Break-ups Online

With the rise of social media in the past 20 years, the beginnings and ends of our relationships are represented in these social technologies [33]. Yet, romantic relationship break-ups remain an understudied type of life transition in HCI, particularly compared to romantic relationship

formation (e.g., [99, 100, 105]) or how romantic partners maintain their relationship through media use (e.g., [90, 98]). The dominating line of work on relationship dissolution originates from Sas & Whittaker [89], who found that the digital possessions – pictures and posts – that remain in the wake of a break-up can be upsetting, arguing for designs that enables “intentional forgetting.” Herron and colleagues have continued this line of investigation, focusing on how to help ex-partners disentangle their lives after a relationship ends [44–46, 74]. Analogous to considering who gets the couch, fridge, and cat¹, Herron’s work has focused on possessions left behind after a relationship ends, like a picture or a post, finding that the attitudes people held towards objects varied, but that the break-up often “tainted” the object with the presence or memory of the ex-partner [45]. In Herron’s work, there are clear ties to Miller’s seminal work on objects in London homes – the relationships we have with objects can be proxies or prompts to our relationships with people [68, 69]. Other work characterized different ways that a break-up might be represented in online spaces – either passively through curation and deletion of possessions, or actively through public declarations [77].

However, this body of work largely ignores the other parts of the social periphery [78] that spring up around and because of a relationship – the connections to other people that also persist after a relationship is over, including connections to the ex themselves. While people tend to use technical features to disconnect from an ex-partner in the wake of a break-up [104], LeFebvre et al. [58] showed that 90% of people do not remove the connections that came about because of a relationship, after that relationship ends – for example, the family of an ex requesting to be Friends on Facebook. In systems where everyone is a “Friend” [31] (Facebook) or “follower” (Instagram, Twitter), the oversimplification of experiences can cause people harm, particularly during or after life transitions [14].

Even conversations traditionally had about a relationship have become represented in features (e.g., Relationship Status) or in other places within a social media profile (such as the biography section of an Instagram or Twitter profile). What was once a one-to-one disclosure (“this is my partner”) can now be a one-to-many disclosure via Relationship Status. Becoming “Facebook official” by changing one’s Relationship Status is now considered part of the normal growth of a romantic relationship and a crucial milestone to reach [33, 34, 72, 83].

The representation of relationships online includes when they end. With a formal disclosure of entering a relationship comes a formal disclosure of ending a relationship. Depending on their specific media ideologies around what is appropriate, people might openly post about their break-up, simply change their status, or avoid disclosure entirely e.g., [41, 58]. Quan-Haase et al. [80] offered a more nuanced typology of coping strategies in the wake of a break-up, suggesting seven types of strategies employed by people online. They also suggested that actions taken after a break-up are goal-oriented, and meant to remove stressors related to the break-up – most often, the content of or pertaining to the ex-partner and relationship [80]. Building on that, Brody et al. [12] established a connection between deleting behaviors after a break-up and adjustment to the break-up.

Remaining connected to an ex on social media can complicate the healing process. Lee & Sbarra [57] showed that emotional distance and physical space are paramount for healthy recovery from a break-up. Yet online, remaining connected to an ex-partner does not allow for that distance to develop [89]. If anything, the nature of social media to connect or encourage reminiscence [50, 55] sets people up to do unhealthy things that will inhibit the healing process. For example, much attention has been paid to “Facebook stalking” – surveilling an ex-partner’s online posts in an attempt to understand what they are doing or who they are seeing (e.g., [37, 63, 64, 101]). Behaviors like Facebook stalking have been shown to actively slow recovery and growth after a break-up

¹see Hop Along’s “Laments”, off of 2012’s *Get Disowned*.

[95], and the availability of information about an ex-partner can complicate recovery in other ways as algorithms leverage existing connections in attempts to provide sound recommendations.

Inherent to break-ups and more broadly, life transitions, is that these are human experiences that come with a change in identity. With break-ups, the connections and possessions that are left behind can still symbolize the relationship, and leave individuals with decisions to make about their post-break-up identity and how to represent it best on social media. We turn now to discussing conceptions of identity and representation in sociotechnical systems during and after a life transition.

2.4 Identity and Representation During Life Transitions

In studying life transitions, researchers have often turned to Goffman's dramaturgical approach to identity [38] to explore how individuals navigate the expectations that different audiences have online (thus avoiding context collapse and the associated negatives that might accompany context collapse) [29, 102, 103]. In doing so, researchers point to the posts and pictures that constitute a self-presentation and how careful curation of those artifacts can enable individuals to find support for new identities. However, digital artifacts can persist even after a transition is "finished," continuing to create problematic situations for people.

Researchers have sought to explore the tensions created by social media sites acting as archives of past lives, holding and displaying digital artifacts that are indicative of past identities long after those identities have ceased being useful to the user (e.g., [43]). Hogan [48] combines these two approaches to identity in social media, articulating the utility of social media operating as Goffman's front stage (performance of identity) while simultaneously acting as an exhibition space (archiving of identity).

Hogan introduces the exhibition as "...a site where people submit reproducible artifacts (read: data). These artifacts are held in storehouses (databases). Curators (algorithms designed by site maintainers) selectively bring artifacts out of storage for particular audiences. The audience in these spaces consists of those who have and those who make use of access to the artifacts" [48].

Hogan then continues, defining the curator's role as the one who creates unique exhibits for each member of the audience. In doing so, he identifies three functions that a curator undertakes in service of this goal:

Filtering – limits the artifacts that are on display to a given audience at a given time. Hogan gives the example of a search for a specific topic on Twitter, which will yield a subset of tweets that are germane to the topic of inquiry. Depending on the visibility of a given tweet, it may or may not be included in the returned subset (e.g., a private tweet is unviewable unless one follows the account that tweeted it; thus, a private tweet originating from an account that the audience does not follow will not be returned).

Ordering – the artifacts being exhibited are ordered in some fashion. The metric by which artifacts are ordered could be simple (e.g., "Newest First" on Facebook, which orders in reverse chronological order) or more complicated (e.g., relevance to the audience).

Searching – while algorithmic curators are constantly working, the audience can also specify additional constraints upon which to accomplish the other two actions. For example, one can view a feed of content on Twitter related to a specific topic based on their search query, which is ordered in reverse chronological order. The action of filtering and ordering here is informed by the search query provided by the audience. In the absence of that query, the curator will default to its regular filtering and ordering.

In the aftermath of a break-up, the curatorial algorithms might continue to exhibit evidence of the relationship which exists no longer. The persistence of the exhibition can be problematic for recovery processes as well as moving on from a break-up. Additionally, adding new things (posts,

pictures) to the exhibition might be complicated by the connections that remain. For instance, what happens when an ex's best friend sees the photo with a new partner (assuming the ex is unable to see them)? While HCI has paid focus to the former, the complicated web of social connections that we maintain in social media can bring with it complicated emotions and dynamics that might not have existed previously.

Accordingly, in this work, we investigated how people approached the representation of their break-up experiences and post-break-up identities in social media. Analyzing these decisions and experiences through the frameworks proposed by Brubaker & Hayes [14] and Hogan [48], we see people acting as curators of their own identities, and doing curatorial work not only for their audiences but also for themselves to create a more accurate post-break-up identity presentation in social media systems.

3 METHODS

In this section, we detail our methods, including the methods used to collect data, the participant sample we collected data from, and our analytic approach to that data. All recruitment and research material (e.g., interview protocols) associated with this research was approved by our institution's IRB (CU Boulder IRB protocol #20-0588).

3.1 Participants

We recruited participants through public social media posts, classroom recruitment, and listserv messages at a large public university in the United States. We used a web form to check that respondents were qualified to participate and to collect their emails. The first author coordinated with participants via those collected emails using his university-affiliated email. All participants received a \$50 gift card as compensation for their participation.

To be eligible to participate, individuals had to be at least 18 years old, but no more than 30, have been in a relationship that was at least 6 months in length, and have had that relationship end sometime within the last 18 months. We required that the relationship had been geographically proximate (*i.e.*, not long-distance) for a majority of its duration, not have been a marriage or civil union, and not have resulted in children. Each of these relationship characteristics have been shown to complicate the break-up process [18, 21, 47, 53, 97]. For instance, work from psychology has identified that the presence of children can complicate the ways in which a break-up occurs [97] and that the legal issues associated with divorce can affect decisions around why and how to end a relationship [47].

Additionally, although not a requirement for participation, all participants were from the United States. The decisions around inclusion criteria outlined above limited our sample, and thus the generalizability to larger populations. However, the experiences of our participants that we detail in the Findings provide a robust starting point for future work to pick up and examine in different samples with different relationship and break-up experiences. We discuss the impact of our sample demographics and avenues for future research based on our sample and subsequent findings in more depth in the Limitations section.

Our sample was predominantly straight ($n=10$), cisgender (all), and white (all). All participants identified as a woman. Relevant participant and ex-partner demographics are reported in Table 1.

We interviewed a total of 11 participants. Participants were between 18 and 30 ($M = 23.27$; $SD = 3.92$), and had been in relationships ranging in length from 8 to 72 months ($M = 28.55$; $SD = 21.24$). All break-ups ended during either 2020 or 2021. Information about participants' relationships and break-ups is reported in Table 2.

Participant	Age	Gender	Sexuality	Ex's Age	Ex's Gender
Kristine	24	Woman	Straight	27	Man
Deborah	20	Woman	Straight	22	Man
Henny	30	Woman	Bi-sexual	31	Woman
Carley	29	Woman	Pansexual	27	Man
Elisabeth	21	Woman	Straight	22	Man
Alex	26	Woman	Straight	28	Man
Kerry	26	Woman	Straight	25	Man
Adeline	20	Woman	Straight	20	Man
Kerina	21	Woman	Straight	21	Man
Sabrina	20	Woman	Straight	24	Man
Angelina	19	Woman	Straight	19	Man

Table 1. Participant (age, gender, sexuality) and ex-partner (age, gender) demographics.

3.2 Approach

We used a two-part data collection instrument, with participants completing an activity packet and then participating in an hour-long semi-structured narrative interview.

Before interviewing, participants completed a pre-interview packet. Our use of a pre-interview activity packet draws on the larger concept of elicitation techniques (see [51]). Elicitation techniques are useful in research when social, cultural, or psychological barriers might inhibit participants' ability to talk about a topic [4]. Specifically, pre-interview activities have been shown to help participants recall past events and facilitate comfortable conversations between interviewer and interviewee [30]. With a wide span of time between when participants' relationships ended and when they participated in our study, we used the pre-interview activity packet to help prompt participants to think about their break-up, and what they did with the pictures and connections online after their break-up. In our pre-interview packet, participants completed up to three activities. Most participants completed all three activities (n=12). The three activities participants completed were:

- (1) **Demographic Questionnaire** – a short questionnaire-style activity where participants answered demographic questions about themselves and their ex. These questions included age (both), what SMSs they use (both), primary SMS (both), gender (both), sexuality (participant), pronouns (participant).
- (2) **Cognitive Mapping** – adopting the approach taken by DeVito et al. [24], participants created maps of their social media use and who they are connected to on those social media sites. Then, participants illustrated how their break-up changed their social media use or who they were connected to on those sites.
- (3) **Letter Writing** – participants were asked to write a letter to their ex-partner about what they would have wanted to have happened to make the break-up and the aftermath of the break-up as “good” as possible.

After returning their pre-interview packet, we scheduled interviews with participants. Interviews focused on how participants managed their digital possessions and connections with others on social media following a break-up.

Interviews occurred during May and June of 2021 and were conducted via Zoom. Interviews were semi-structured, and we designed the interview protocol to be narrative and episodic in nature. Narrative interviewing allows participants to “express their experiences... of the topic being studied through telling stories or narratives” [5]. This approach to data collection allows the interviewer

Participant	Relationship Duration	When the Relationship Ended*	Who Initiated the Break-up	Reason for Break-up
Kristine	54	July 2020	Participant	Family Pressure
Deborah	48	October 2020/January 2021	Mutual	Grew Apart
Henny	72	October 2020	Participant	Infidelity
Carley	26	July 2020	Mutual	Grew Apart
Elisabeth	36	July 2020	Participant	Grew Apart
Alex	10	August 2020	Participant	Incompatible
Kerry	18	April 2020	Mutual	Incompatible
Adeline	12	March 2021	Participant	Infidelity
Kerina	8	October 2020	Participant	Incompatible
Sabrina	18	February 2021	Participant	Toxic Relationship
Angelina	12	March 2021	Mutual	Grew Apart

Table 2. Relationship/Break-up information – relationship duration (in months), when the relationship ended, who initiated the break-up and why. **“Grew Apart” indicates a relationship where the participant described that they realized that they had different goals for the relationship and/or their future than their ex, but had been together for a significant amount of time (self-determined). “Incompatible” was used when participants described a fundamental issue that led to the break-up.*

to “reconstruct social events from the perspective of informants as directly as possible” [52]. We started by asking participants to talk about the relationship pre-break-up and the break-up itself. Beginning interviews with a narrative prompt (e.g., “Can you tell me about the relationship, before you broke up?”) aligns with Flick’s [32] definition of episodic interviewing, where the interviewer “...combine[s] invitations to recount concrete events (that are relevant to the issue under study) with more general questions aiming at more general answers (such as definitions, argumentation and so on) of topical relevance. ...interviewers should mention concrete situations in which interviewees can be assumed to have had certain experiences.”

As participants shared stories about the relationship, break-up, and aftermath of the break-up, we asked follow-up questions about why participants made decisions about what to do with digital possessions or connections, how different experiences they had online made them feel, and what they would or would not have wanted to happen differently online. Participants often referenced the pre-interview activities in telling stories and answering questions, and we leveraged those activities in asking follow-up questions in tandem with the experiences participants discussed.

Cognizant of the emotional implications of the topics being discussed, we had procedures in place to help minimize the emotional risk that participants might face from participating. Breaking up is a difficult life experience for both involved parties [81]; reliving the experience of breaking up could be emotionally traumatic. We were sensitive to signs of distress [13], and resources for counseling and mental health services were made available as part of the study information sheet.

To protect participants’ identities, we transcribed and anonymized each interview before analysis. Each participant has been given a pseudonym, and all locations and other possibly identifying information have been aliased. We refer to participants by their pseudonyms for all quotes and use “John” and “Jane” to refer to their exes when they mention them. We provide a short summary of each participant and their unique experiences below:

Kristine, 24, and her ex-boyfriend met during college. She broke up with him in July 2020 because of her family disliked him, particularly because he was of a different religion. She did not want to break up with him and remains distraught over the break-up.

Deborah, 20, and her ex-boyfriend were high school sweethearts who ended up attending the same university and living together. She described the break-up as mutual in nature, with the initial conversation happening in October of 2020 and the break-up becoming final in January 2021.

Henny, 30, and her ex-girlfriend broke up after Henny discovered her ex's emotional infidelity with someone else. Her ex moved out within a day of the break-up, taking their dogs with her.

Carley, 29, and her ex-boyfriend met in graduate school and lived together after moving to a new state. She described the break-up as mutual in nature, with her ex moving out in March 2020 as they took a break before finally breaking up in July 2020.

Elisabeth, 21, broke up with her high school sweetheart of three years in July 2020. She said that after going home due to the pandemic, she "started to not feel it anymore."

Alex, 26, met her ex-boyfriend on a dating app, and they dated for 10 months before she broke up with him in August 2020. She stated the reason for the break-up was that her ex's entire personality changed, to the point that she felt like she didn't know him.

Kerry, 26, and her ex-boyfriend dated for around 18 months before they broke up towards the beginning of the COVID pandemic. While she described the break-up as being mutual in nature, her ex initiated the conversation.

Adeline, 20, broke up with her boyfriend of around a year in March 2021. She broke up with him after finding out that he was lying to her about what he was doing with other women.

Kerina, 21, dated her ex-boyfriend for around 8 months before realizing that they had different priorities and breaking up with him. They briefly dated again a few months later, but nothing had changed, so she ghosted him.

Sabrina, 24, dated her ex-boyfriend for around a year. She described the relationship as toxic, to the point that she described the break-up in terms of gathering her things and leaving their apartment without saying anything to her ex.

Angelina, 19, and her ex-boyfriend were part of a large group of mutual friends before they started dating. They dated for about a year before breaking up, and are still friends via the larger group.

3.3 Analysis

The interview data were analyzed using an inductive approach based on thematic analysis [11]. Analysis ran concurrently with interviews, allowing us to look for nascent insights or themes and adjust the interview protocol for subsequent interviews when appropriate. Recruitment concluded after we reached saturation.

We conducted an open-coding of each interview transcript, reading and coding line-by-line [11]. In coding, we paid close attention to how participants thought about the representations of the relationship (e.g., pictures), the connections they still had that had sprung up as a result of the relationship (e.g., Friends on Facebook), and how they managed those things after the break-up (e.g., deleting/archiving pictures; unfollowing/unfriending Friends on Facebook). As we coded interviews, we used code and theme memos to describe how codes were connected to each other as well as potential higher-level themes [88]. Both authors held regular meetings to discuss emerging codes and themes.

After completing the initial round of coding and memoing, both authors discussed the emergent themes that were present in the code system and identified how they were connected. The first author then wrote detailed theme memos, which helped develop the initial themes that were identified during the coding process. We then returned to the interviews to ensure that the themes

were grounded in and well-supported by the interview data. Our analysis yielded 4 principle findings, which we discuss next.

4 FINDINGS

Our analysis of participants' experiences and decision-making in the aftermath of a break-up highlighted a distinction between possessions and connections. Throughout our findings, we unpack this distinction by detailing the qualities of possession and connections, as well as the decision-making practices that participants engaged in for each.

We start with a focus on possessions, identifying the factors participants considered while making decisions about offline and online possessions. Second, we report on how participants enacted decisions, and detail how those actions served as a form of identity presentation management in the wake of their break-up. Third, we turn to connections, describing the different types of social relationships and their digital representations that existed for our participants post-break-up. Finally, we discuss the difficulty participants encountered in attempting to manage digital connections, particularly in comparison to the relative ease with which they managed digital possessions.

4.1 Possessions

Our participants discussed many different objects that held meaning and memory after their relationship had ended. We use the term *possessions*, in line with prior work (e.g. [44]) that used the term, to describe the physical and digital objects that remained after a break-up.

In our analysis, we identified five factors that influenced people's choices around managing their possessions: *residual memories*, *replicability*, *audience*, *intentionality*, and *value*. While these factors may overlap or influence people's decisions concurrently, we present them separately to highlight the unique considerations and challenges they prompted in our participants' management of their physical and digital objects.

4.1.1 Residual Memories. Some possessions held **residual memories** of the ex or the relationship and could trigger those memories. The initial memories that possessions could spur recollection of could be good or bad. For instance, Elisabeth told us about her camera and the associated memory of who was with her when she found and bought it:

I bought my film camera with him [the ex], all that kind of stuff you don't really think about until you see it again. (Elisabeth)

For Elisabeth, the camera is a reminder that her ex was with her when she got her camera, and so the camera and the photos she subsequently took while learning to use the camera prompt memories about him and their relationship. For Elisabeth, as with many of our participants, these memories were not necessarily bad. Instead, as Adeline put it, "Pretty much all [of] my memories are happy ones."

While the memories that were sparked by possessions were often good ones, they often came loaded with additional baggage. Possessions can be "tainted" with an association to the ex, as Herron has previously noted [45]. Elisabeth talked about tainted possessions in the context of pictures of her:

When I came to college he took a picture of me, and I look really good in it, and I like the picture, but it's always going to be that he took the photo. (Elisabeth)

Although there was less variety in the types of digital possessions compared to physical possessions, participants' digital possessions still often held residual memories of the relationship and their ex. However, digital possessions often surfaced happier memories, as Kerina implied when

discussing pictures on her social media, saying, “I would say most of them are nice memories” (Kerina).

Kerina’s sentiment towards her digital possessions and the memories that they surfaced was not uncommon. Many of our participants talked about how their digital possessions inspired moments of nostalgia. Yet they often also made participants reconsider the break-up. For instance, Sabrina talked about how her pictures made her think of happy memories, but then also reaffirmed the break-up:

They’re actually kind of motivating for me. Because it’s always a temptation to want to reconnect with someone that you’ve broken up with, and I know I can look back at those pictures, and be like, ‘Wow, like no. That would be really bad, we don’t want that.’ So yeah, they actually have that kind of positive effect, too. (Sabrina)

Thus, digital possessions often served a dual purpose – inspiring moments of nostalgic reminiscing, but also reminding participants of why they broke up and that that was a good thing to have happened.

In rare cases, participants’ reactions to possessions were initially negative or were so negative as to impede healing from the break-up. Kristine, who did not want to break up with her boyfriend but did so due to family pressure, talked about her digital possessions as being painful reminders. She took the approach of not doing anything to them, instead letting them “get buried.” She rationalized her approach simply by saying, “Out of sight, out of mind” (Kristine).

However, for most participants, possessions were imbued with positive memories and associations, even if they did occasionally surface memories that were not wanted or that were upsetting in some way. Participants thought carefully about the memories a possession could spark. If a possession came imbued with negative associations, or those associations did not fade with time, participants were more likely to do something with that possession to limit their exposure to it and subsequently the residual memories associated with it.

4.1.2 Audiences. Possessions and actions that manage possessions are viewable by **audiences**, who could draw interpretations of what experiences and identities those objects and actions might represent. For example, Kerry reasoned that her ex deleted photos of them after their break-up because leaving them up would paint the wrong impression of their relationship status:

Since he didn’t use social media [as much], I think more of his profile than mine was pictures of us. And so if you are trying to move on and date someone new that might not be the best presence you’re putting out there for someone new wanting to date you. So I can understand that [deleting photos from social media].

When participants decided to manage their physical possessions and place them out of view, the act of placing items out of view rendered them private and hidden from others. For instance, Alex told us about letters that she had kept from her ex-boyfriend – it is unlikely, at best, that someone else would notice the absence of those letters. If visiting her house or even her room, those letters would remain out of view, rendering that portion of her identity out of sight to an observer. Only by having previous knowledge of the relationship could someone know that part of her identity.

Even the very act of hiding physical possessions is a largely private affair. Unless an observer had intimate knowledge of an individual’s life (unlikely, given that the individual has gone through a break-up with the person most likely to possess that knowledge), the possessions that one might choose to hide would not be noticeably missing to an observer. Alex’s letters were not shared with anyone else – they were only between her and her ex. So putting them away would not be noticeable to anyone else. Even more readily obvious possessions, like Kristine’s sweater, are likely to go unnoticed when they go missing.

In this way, putting the physical detritus of the relationship away after a relationship ends is an act of self-presentation, only to an audience of one. It renders the relationship less visible to the individual who is putting the possessions out of sight until they are ready to handle them according to the philosophies described earlier.

However, the digital possessions were more public than the physical possessions of the relationship. Anyone could go and look at the digital possessions associated with one's account, at any time, in a way that would be socially unacceptable and logistically impossible to do with physical possessions. The accessibility of digital possessions to others also meant that actions to manage them, like deleting them, are less likely to go unnoticed the way that actions done to physical possessions can. An observer can easily notice if a picture has been deleted from one's profile, and begin to draw conclusions about what that deletion might mean.

As part of deciding what to do with their possessions in the wake of a break-up, our participants carefully considered the audiences that were present and could view those possessions. In part, the considerations they made around audiences were tied to identity – how might the audience think of the individual, based on the possessions they could see. Thus, we saw our participants considering what type of identity they wanted to portray, which we discuss more in-depth later.

4.1.3 Intentionality. Viewing possessions required **intent**, or a desire to examine the possessions. Alex, who retained physical letters from her ex-boyfriend explained that:

If I want to go through a letter, I'd have to take the time and find it, and I'd have to be home in order to do that. (Alex)

Going to look at a letter or a box of possessions often requires some level of intent, as Alex points out. One must 1) know where the items are, 2) have a desire to go look at those items, and 3) make time to go to where the items are.

Yet, digital possessions presented a challenge that physical possessions often did not. Physical possessions can be collected and placed out of sight, as Sabrina did with the physical remnants of her relationship:

All the stuff we got together that I have, I've collected in a safe, like a keepsake kind of a box. (Sabrina)

However, digital possessions, like pictures posted on a social media site, exist in the cloud. They were available so long as one had an internet-connected device. In other words, for all of our participants, their digital possessions were always close at hand because they all had their phones near them at all times. They are imminently accessible – while Alex had to go to a specific place to find and read the old letters from her ex, the pictures on her Facebook or Instagram were available to view anywhere at any time, so long as her phone had some type of Internet connection.

In practice, our participants did not go back and look at their online possessions often. But when they did, it did require intention – they had to find the specific place where those possessions are stored. What complicated digital possessions for our participants was the ability of algorithms to leverage possessions to make suggestions. These algorithms include ones that provide reminiscence, like Facebook's "Memories" feature or Snapchat's "Month in Review" features. Systems like these leverage our digital possessions to provide us moments of reminiscence often centered around a specific day or time period (for example, Facebook's Memories feature shows possessions from that day in previous years) [50, 55].

In many scenarios, and with many digital possessions, reminiscence systems work well. However, when it comes to life transitions and particularly break-ups, these features can offer reminiscence that is insensitive and unexpected [78]. For example, when asked how her Snapchat Month in Review from the prior month made her feel – a month in which she had broken up with her boyfriend

– Adeline said it made her “So sad” (Adeline). Even when seeing possessions via reminiscence features was not a sad occurrence, it could still be weird, as Elisabeth discussed:

I don’t know. It’s like some twinge of a feeling. It’s nothing that sets me back in my day or anything like that. (Elisabeth)

Or inspire an odd nostalgia, as Angelina noted:

I don’t know if I’d feel upset, but more so just nostalgic, almost. (Angelina)

The algorithms’ use of possessions removed the intentionality that would otherwise be required to view possessions, and thus violated participants’ expectations of what they would see. When considering what to do with possessions in the aftermath of their break-ups, our participants thought carefully about how accessible they wanted their possessions to be, and how they might feel if surprised by seeing possessions (whether through coincidence or targeted reminiscence).

4.1.4 Value. Possessions have **value** by virtue of the effort that it takes to create or destroy them. When considering what actions to take with their possessions, participants evaluated the value of the possessions.

Take Kristine, for example. She saw value in her possessions, and so she sought to scrub the negative associations that possessions had to her ex-boyfriend by using them in new ways or contexts. Kristine shared a similar sentiment as Elisabeth regarding a sweater of her ex’s that she still had – the sweater reminded her of her ex-boyfriend, which in turn reminded her of the relationship and how much she did not want it to end. That imbued the sweater with value, and consequently, Kristine did not want to get rid of it. Kristine also gave value to experiences, which informed decisions that required great amounts of effort to enact. For her, the TV shows that she had first watched with her ex inspired memories of that time, subsequently surfacing memories of the relationship as a whole. Regardless of the type of possession, she described a process of reclamation that she had begun to undertake:

I’m trying more now to get some stuff back that I liked, that reminded me of him without letting it remind me. Like TV shows we used to watch, I’m re-watching those. Or I have this one really nice sweater that I love that I took from him that I’m trying to start wearing again. (Kristine)

In “get[ting] some stuff back”, Kristine is attempting to cleanse possessions of their association with her ex. She accomplished this by using them in new contexts, creating new memories that do not involve her ex. For example, with her TV shows, Kristine said:

I definitely don’t think I could have just picked up where we left off, so I’ve started re-watching them all from the beginning, by myself. (Kristine)

Even with the great expense in time – re-watching hundreds of TV episodes – Kristine felt this was a justifiable thing to do to remove the association between the shows and her ex. Resuming watching shows, or watching new seasons of a previously viewed show, would still hold some connection to her ex, which she did not want.

The value of possessions played a role in our participants’ decision-making around management. Depending on the imbued value of the possession, participants might consider it worth keeping or find it more useful to get rid of it.

4.1.5 Replicability. Lastly, possessions could be **replicable**, referring to the ability for multiple copies of a specific possession to exist.

Physical, offline possessions are often unreplicable – that is, there is but one copy of each item. Recall Kristine’s sweater; while there are likely many sweaters of that particular shape, size, style, or design, there is but one sweater to her. Unreplicable possessions occupy a specific space in the

world, and the participant had to be in the same physical location as the possession in order to do anything with it. The tangible and unique nature of physical possessions made them important to participants, echoing findings from previous work on death and grieving [17].

Even in cases where the possession might be accessible in several locations (e.g., Kristine’s TV shows might be viewable on demand), the principal site of access is a more private space like a bedroom, and the possession is not the TV show itself, but rather the experience of watching the TV show (for research on this, see Gerbner’s Cultural Indicators Project [35]).

Digital possessions, however, are replicable in nature. They are infinitely more creatable and accessible, as we previously discussed. These features extend to the duplicable nature of digital possessions – one can make as many copies of a digital artifact as they can store on a hard drive or in the cloud. Extending into social media, possessions can be copied or screenshot and subsequently reposted, creating a duplicate possession that has a different owner from the system perspective. Moreover, systems sometimes create copies of possessions and assign different owners to those copies than the original (for example, in Facebook’s “Memories”).

For participants, the replicability of possessions meant that they felt they could safely conduct possession management (e.g., delete pictures from Instagram) without entirely losing the picture. For example, Adeline said she had no issue deleting photos from her Instagram, because, “I like to lay out all my camera photos, so I can see them all. So I deleted the pictures [that had her ex in them], so I didn’t have to see them” (Adeline). In some cases, the replicability left participants with camera rolls full of pictures, that they had not done anything with. For instance, Kerina reasoned that she had so many pictures and her lack of managing them could be attributed to laziness.

Yet, not everything is maintained when the Instagram picture is reproduced as a photo in one’s camera roll. As Adeline noted, the comments and format of an Instagram post are lost when it is reproduced in a camera roll. Moreover, the slideshow format of posts with multiple pictures is also lost, as Henny told us. Thus, the ease at which something might be reproduced played an important role in considering what to do with a possession in the wake of a break-up.

The decisions that participants made about what to do with their possessions after a break-up were heavily influenced by how important they found each of these factors. Next, we discuss the decisions they made based on those factors, and how they enacted those decisions on SMSs through technical features like deletion.

4.2 Managing Digital Possessions

In the aftermath of our participants’ break-ups, they were left with possessions that represented their relationship. On SMSs, they had several different actions available to them to manage possessions – deleting, archiving, and of course, doing nothing. But before they utilized a feature, they had to make decisions based on their management objectives *vis-a-vis* their post-break-up identity. We identified two objectives that informed our participants’ decisions around managing their possessions, which in turn impacted their online identity: using identity management features to acknowledge that the relationship had existed, and using management features to present an identity of singleness.

4.2.1 Future-Facing Identity. For some participants, they felt that leaving the possessions of the relationship up on social media painted an inauthentic portrait of who they currently are. To address this inaccuracy, participants described deleting possessions from their social media to curate an identity that was more accurate of who they were after the break-up.

Some participants, like Henny, thought carefully about which possessions to delete:

I feel like I deleted things that showed our intimate connection. (Henny)

Henny did not want to completely delete the fact that she had been in a long relationship with her ex, but she was also concerned with the ramifications of having pictures and videos up. Namely, she worried that as she started to date again that having such possessions still on her profile might confuse potential partners. Henny ultimately decided to only keep a few things from the relationship online:

I view my social media as a facade. I put the best things – I’m not going to put shitty pictures of myself on social media. I put things that I’m proud of, and I put markers for what I think, represent, who I am. And I didn’t want her [Henny’s ex] to be part of who I am to strangers and acquaintances. You’re no longer a VIP, so you don’t get to be on the social media. (Henny)

In contrast to Henny’s selective curation and deletion practices, Alex deleted any possession related to her relationship from Instagram. She described feeling as though the relationship was not worth remembering or having represented. Accordingly, she not only deleted everything about the relationship from her Instagram but also deleted everything from her phone’s camera roll. Alex described a specific order to accomplishing the deletion of her digital possessions, starting with Instagram, then deleting photos from her phone. When asked why she did the deletion in that order, she reasoned “Because Instagram is public” (Alex).

To Alex, it was important to delete the things that were available to many audiences, because leaving possessions up could paint an inauthentic picture of who she is – in this case, that she was still dating her ex-boyfriend. The possessions on her phone, that were not available to anyone else, could be handled later. Alex was not aware that archiving was a feature on Instagram – she thought deleting was archiving. Accordingly, she was using her phone’s camera roll as an archive to retain possessions out of the “public eye.” However, even after being made aware of the feature during the interview, she still reasoned that archiving would not be appealing to her:

I thought that was archiving them, saving them [to my phone and then deleting them from Instagram]. I’m not very tech-savvy. But also, no I don’t think I would anyways because I don’t feel like I need those photos. And I know for sure we’re not getting back together, so there’s no point in keeping those photos. (Alex)

Ultimately, Alex was going to delete the digital possessions from her relationship. Archiving them within Instagram would have complicated the process she outlined (Instagram first, camera roll later) in a way that upon reflection she felt would not have been useful.

Adeline also did not see a purpose for archiving:

I think if I archive something, it would be if I would ever want to put it back up. And maybe that would be the case if I thought we were getting back together. But we’re not. So I didn’t see a point [in archiving]. (Adeline)

But archiving does serve a purpose, striking a middle ground between deleting and leaving possessions up. Archiving removes the possession from one’s outward-facing profile, rendering it invisible to the audience to that account. For the account holder, it moves the possession to a separate feed, rendering it out of their view on their main profile. To access the archive, one must go into the profile in a process that can take many clicks. Thus, from the account holder’s perspective, the possession remains up, but in a different, more private location.

Archiving features come with the ability to reverse the action – to unarchive a possession, and render it visible to the wider audience once more. However, even when archiving was used, as Deborah describes, it was not with the intention of restoring them to her public feed at a later time:

On Instagram, we didn't delete our pictures immediately. I archived mine because I don't want to delete them forever. Not that I will repost them, but just for myself.
(Deborah)

Of the three participants (Deborah, Elisabeth, and Angelina) who did archive possessions, none talked about reposting or reversing the archiving. Instead, archiving was used to create space from the relationship, and to update one's outward social media identity (similar to deletion), but kept the pictures available to one audience – the participants themselves. In this way, archiving digital possessions acted like hiding physical possessions from view, as we discussed earlier.

Archiving removed possessions from the view of audiences, including algorithms. Used to create space, as Deborah implied, archiving places possessions slightly out of view. In practice, participants did not go back and look through their archives often, meaning that archiving is far closer to deletion than might otherwise appear. Thus, archived possessions were left in a state of limbo – not deleted, but still somewhat available, albeit through several clicks and screens.

Through the experiences of our participants, we see the actions of deleting or archiving possessions on social media sites as people considering their identities on these sites as present-oriented – who they were in that moment – with their future in mind. Having possessions remain online that were indicative of a past relationship was not authentic to who they were currently. Deletion and archiving became an action meant to update identity, to make the exhibition of one's self online current.

However, not all participants were interested in making their online identity current and “ideal” for future partners. Next, we discuss a second objective that some participants thought was important – making their online identity representative of their entire lived experience.

4.2.2 Past-Facing Identity. For other participants, deleting or otherwise hiding possessions felt inauthentic to their lived experiences and who they were. For participants of this philosophy, they decided not to delete anything, leaving digital possessions on their social media sites even after the relationship had ended. For instance, Adeline described doing this and reasoned that:

For me, I just don't mind anyone seeing my life because that's what genuinely happened or that's how I felt at the time. So yeah, I just leave them [up on social media] (Adeline)

For Adeline and others, they saw deleting possessions after a break-up as being ashamed of the break-up and trying to hide it. But they were not ashamed to have dated their ex and did not want to lose those possessions or the memories associated with them. Accordingly, they did not delete or archive anything.

Kerina took a different approach – she thought carefully about what deleting the possessions would accomplish for her, and ultimately decided she was not going to gain anything by deleting or archiving them. She also considered what her ex had done with his possessions when making her choices:

Right after the break-up, I was like 'Oh, maybe I should archive or delete all of these because it'll give me some kind of closure.' But I kind of let go and realized the way I was going to get closure from that relationship was not going to be through deleting a bunch of Instagram posts. Also, he didn't delete his, which I'm not gonna lie definitely played into my factors. Like, if I would've seen his deleted I probably would have been like, 'Nope, you're done.' But he didn't delete his... I would've understood if he deleted them, but it would've been like 'Fine, you delete them, I delete them' type of thing.
(Kerina)

Of course, not conducting possession management could lead viewers to misinterpret one's relationship status. But to Carley, it would feel odd to see someone's profile and not see any pictures

of past relationships. She explained her reasoning, in a similar way to Adeline, of viewing social media as a timeline:

For me, social media is in a small way a timeline of someone's life and my long-term relationships. John was my fourth long-term relationship and they have been a significant part of my life and I wouldn't want to erase them. I'm very much grateful for all the experiences. I don't do a nostalgic look back at our pictures or anything, but I don't want someone I newly friend to be like, "Oh, they've never dated anyone" or like, "That's weird they have no documentation of their relationships." It can be uncomfortable, part of dating someone, finding out about their exes, but for me, it's like, "Well, they've shaped who you are, who I am in my new relationships, so it's important they're still there." (Carley)

While Carley and Adeline did not delete or archive their possessions – they left them available to their audiences – they did accomplish other forms of possessions management. These actions allowed them to retain those possessions, but not foreground them. Adeline changed her profile picture a day after the break-up, reasoning that, "I know no one would be going in and looking for it, but to me, it felt false to have that still there" (Adeline). Carley un-pinned a photo of her and her ex from her Featured Photos on Facebook. When asked why she explained, "Apart from [my dad], he's the only male in my Featured Photos and so it felt very inappropriate to keep that up" (Carley).

These actions allowed them to curate an identity of not being in a relationship currently, while still enabling a viewer to realize through viewing possessions that they *were* in a relationship at a previous time. For instance, Adeline's current profile picture on Facebook is of just her, but the very next one is of her and her ex-boyfriend.

For our participants who left their possessions up on social media after their break-up, they were considering their identities from a holistic stance. Rather than creating an "ideal" presentation of who they are in the present, they viewed their social media as both past and present. Thus, it would be inauthentic to delete possessions indicative of a past relationship, and not removing possessions became an act of authenticity to their entire represented lives. However, they were still able to curate an identity that is of the present – by backgrounding those possessions via actions like changing profile pictures or unpinning significant photos that would be viewable upon a quick glance of their profile.

Possessions were not the only remnants of a relationship to be available online. Social relationships and their digital representations also persisted past the point of a break-up. Next, we describe the different types of social relationships and connections that existed after a romantic relationship ended.

4.3 Connections

As a result of their romantic relationships, participants had social relationships with many people – to their exes, to their exes' families, and to their exes' friends. Some categories of social relationships are relatively stable as they are defined by social norms. For example, the authors are children and siblings to their parents and siblings, respectively. Other types of social relationships are more fluid. For example, friendships naturally ebb and flow over time.

At their core, the social relationships we maintain with others, such as with friends or romantic partners, are buoyed by a mutual, performative trust that the two parties establish via interaction. For instance, telling a romantic partner "I love you" symbolically reinforces the unique social relationship that one has with that person. Symbolic trust works to reinforce these relationships. However, such trust is not always apparent to an outside observer, and it is not always readily apparent when the relationship changes or ends.

When a relationship does end, it often comes with an explicit expectation of distance. One might not want to see their ex-partner and take steps to set boundaries and ensure that does not happen, as Henny described:

She would send me snaps of the dogs early on [after the break up]. I think just trying to tug at my heartstrings. And that would always lead into, “Well the dogs really miss you, we should go to the park or something and you can see the dogs. I know you miss the dogs.” And I’d always have to be like, “No. Yes, I’ve missed the dogs, but no I don’t want to see you and I don’t want to see them.” (Henny)

Other expectations may be based on implicit norms, like not seeing each other anymore (or at least less than before, and in a less intimate way). In cases where those norms are adhered to, the end of a relationship means that one is left with less knowledge of what their ex is doing, even if they remain interested in knowing. For example, Elisabeth talked about wanting to know what her ex-boyfriend was up to when asked if she had seen anything about him online:

I have not actually, so that’s been the weirdest part. I really don’t know what he’s up to. I really just don’t know what he’s up to and that kind of bothers me because people kind of know what I’m up to because I post about it. (Elisabeth)

The end of the relationship does not erase the relationship. Elisabeth’s ex-boyfriend will always be that – her ex-boyfriend. Rather, a break-up closes off the future, leaving one with only memories of those people and/or the relationships once existed. As discussed previously, possessions can act as a proxy for the relationship, sparking memories. However, ending a relationship frequently fixes it in the past, freezing who the ex-partner was. Over time, these memories of the ex become increasingly removed from who the ex has become as they have moved on from the relationship.

Experiencing a break-up is experiencing the ending of social relationships with others beyond the ex. While not impossible, it is less likely that one will see the ex’s family in the absence of the ex. While still together, exes often serve as conduits to relationships with their family members, providing both the reason for and the logistics that enable these relationships. The break-up removes that conduit. For example, Deborah’s ex-boyfriend wanted to remain close with her family, to the point of spending the holidays with them (and her). As a result, they delayed their break-up:

We decided we were going to break up in October, but because my dad’s super fun and he has a tough relationship with his dad he wanted to spend Thanksgiving with me and part of Christmas. So we stayed together until January because he wanted to spend more time with my family. I was like, ‘That’s okay, I’m okay with that.’ (Deborah)

Deborah acted as a conduit between her ex-boyfriend and her family, to the point of extending their relationship. But after they broke up, she ceased to act as a conduit, to the point of telling him he could not go on a trip with her towards the very end of their relationship:

My dad remarried, and my stepmom has three girls, they’re all younger. And that was part of John wanting to spend time with my family over the holidays, he wanted to get to know them a little bit. But I also wanted to bond with them because I’m there so little of the time. So we were going to go to the beach to visit my dad’s friends, kind of like a family vacation, and John wanted to go. But at that point, I wanted to spend time with them because they barely knew me. So I wanted those two weeks at the beach to be for myself.

Offline, obtaining the space from an ex, the relationship, and people associated with the ex is a healthy behavior noted in the literature [22, 67]. However, it was harder for our participants to find that space online. Social relationships are often calcified into **connections** in SMSs – for example, being Friends on Facebook, or following another individual on Instagram. Online connections take

the form of the encoded 1:1 relationship that exists between two accounts on a given platform (e.g., Friends on Facebook, following on Instagram). Some connections are symmetrical in nature; that is, if a connection exists between two accounts, it exists in the same state for both accounts. Facebook's Friend is a symmetrically connecting system – one is Friends with another, and that other is simultaneously Friends back. Non-symmetrical systems allow different types of connections to occur between two accounts. For instance, Instagram does not require one to follow another back; one can be followed without following.

Additionally, online connections do not require the conduit that offline connections do. Online, conduits do not exist – it is possible to remain connected to an ex's family or friends without being connected to the ex. By default, the connection to these groups will persist beyond the end of the relationship, unlike offline settings where dissolving the relationship with an ex also results in the dissolution of relationships with others.

While offline there is just the social relationship and its physical embodiment through possessions, as previously discussed, online there can be many connections between two people across many platforms. Moreover, the very connection itself is an object, and so leverageable by algorithms to make suggestions – either to expand one's network (e.g., People You May Know on Facebook) or to show people from a network on a given platform that one might be most interested in seeing (e.g., organizing the stream and story feed on Instagram based on a variety of data metrics). Thus, making decisions about what to do with each of the connections to individuals in these groups became an important part of the post-break-up experience for our participants.

4.4 Managing Online Connections

Unlike offline relationships with others, which in the wake of a break-up can come with pre-determined or implied decisions about whether to remain in contact or not, online connections require active decision-making around what technical actions (e.g., unfollowing, unfriending, etc.) to use in the wake of a break-up. For each of the previously identified groups, our participants made decisions around what to do with the connections to various people within the group and made decisions for each SMS on which a connection exists. These decisions required granular work in two ways as a result of them being represented in SMSs. First, disconnecting from a person required actions for each platform on which a connection existed. For example, disconnecting from someone on Facebook would not automatically disconnect from them on Instagram. Second, disconnecting from one person would not disconnect from others. In other words, disconnecting from an ex within a platform would do nothing with the connections to family or friends of the ex.

Broadly speaking, our participants actively managed their connections with their exes. However, disconnecting from the ex's family, friends, and even mutual friends was typically prompted by content they encountered as they navigated various SMSs.

In this section we describe the choices our participants made with various types of relationships, highlighting how the ways these relationships are represented online present additional challenges and surprises following a break-up.

4.4.1 The Ex. All of our participants had connections to their ex on multiple SMSs. When it came to considering what to do with those digital connections, our analysis found that decisions depended strongly on the context surrounding the break-up and how they felt about their ex. For some, seeing their ex post things in the aftermath of the break-up was hurtful to them, and so they disconnected. For others, they did not feel as hurt or did not feel as though they saw enough of the ex to merit disconnecting.

Some participants, like Angelina, decided to remain connected across all of their platforms. When asked why she reasoned: "He's not that big of a poster. Never really was" (Angelina). Her

ex's minimal use of social media meant she did not anticipate being bombarded with his posts. As a result, she anticipated that disconnecting from him would have little impact, and thus felt unnecessary.

In other cases, remaining connected to an ex became about honoring that there was still a relationship, albeit not a romantic one. Recall Henny, who talked about her rationale for removing possessions as one of "base" friendship versus "VIP" status. Her rationale for possessions extended to her decisions around remaining connected to her ex, but opposite to her stance on possessions – she would welcome a relationship with her ex, and considered remaining connected as an intermediary step until her ex was able to have a working friendship offline:

I felt like we could be friends, and you know, kind of move on, still be a positive presence in each other's life. But she's just refusing to have that outlook with me. (Henny)

Henny's ex had yet to come to terms with the break-up. But as mentioned previously, Henny's approach to social media was to use it to represent who she is currently, not who she was. While it was important to Henny to remove photos and other possessions that represented their romantic relationship, she decided to remain connected to her ex-girlfriend as a way of acknowledging that she would be open to remaining friends.

Remaining friends after a break-up was a scenario that many of our participants imagined. For some, like Angelina, a friendship pre-dated any romantic relationship. In Angelina's case, she had been friends with her ex-boyfriend as part of a large, mixed group of friends before they dated:

We're still part of the same friend group, we get along fine, but it's just simply on a friend level. I don't even think about that [the relationship] anymore. (Angelina)

Others described wanting a platonic relationship in the future. Adeline, for one, expressed a need for some distance after the break-up for her own emotional healing, but did not want to disconnect from her ex entirely:

I don't have hard feelings for him at all, but I think it comes across that way. Whereas for me, it's just for me feeling better and getting through it. So sometimes I wish there was a socially acceptable way that you could refollow them a year or two later when it wouldn't hurt to see them. (Adeline)

In both Angelina and Adeline's cases, they might not have wanted to see their ex online in the direct aftermath of the break-up, but eventually came to the point of not being bothered by it.

Similarly, although Alex did not feel strongly about the loss of her relationship, she asked her ex-boyfriend to remove photos of her from his profile/stream because he was trying to date other people, and they were seeing pictures of her on his Instagram and contacting her. However, she was offended when she saw that he had unfollowed her on Instagram as well:

He deleted the photos, and then unfollowed me... [But deleting the connection is] not what I asked him to do! It just seemed like he was taking an extra step. (Alex)

Alex was attempting to leave the relationship in the past, but her ex's drama (from attempting to date new people) was annoying. However, his reaction of also unfollowing her seemed petty, and thus offended her.

The factors that our participants considered when deciding about their connections to their exes became less relevant for the other groups. Instead, our participants grappled with the ease at which connections continued past the end of the offline relationship.

4.4.2 The Ex's Family. For most of our participants, the relationships that they had had with their ex-partners were either deep or long enough that they also became close with their ex's family. This closeness extended into social media, where they were Friends with or followed their ex's parents and siblings on different SMSs. After their break-ups, participants were left with connections

to these family members who were likely to post content that included or were about the ex. Participants often did not want to see that type of content or felt it was inappropriate to remain connected to those family members. Accordingly, most of our participants who were connected with family members of their ex disconnected from those people. For example, Elisabeth discussed her eventual decision to disconnect from her ex's mother after seeing her appear in her Facebook feed:

It was probably a couple of months later. I just realized, okay, I don't need to be doing this anymore. It was like another level of breaking up. I just kind of felt like another level of leaving that behind. (Elisabeth)

Elisabeth described herself as initiating the break-up, and still felt the social ramifications of disconnecting from her ex's family were significant. While she wanted to protect herself from seeing unwanted content about or containing her ex-boyfriend, she felt it was socially unacceptable to disconnect from her ex's mother.

In rare cases, participants actively maintained connections with an ex's family after the break-up. However, these instances were always the result of specific contexts that rendered the need to disconnect less important. For example, Angelina stayed connected with her ex-boyfriend's sisters after they broke up:

I still follow his siblings, but we also all went to high school together, so I knew his siblings before we even started dating. (Angelina)

Angelina's experience illustrates the importance of context – she knew her ex's sisters, and they knew her, in a social context separate from the romantic relationship. Thus, she felt comfortable remaining connected with them. In contrast to other participants, Angelina also remained connected to her ex. So she was not bothered at the possibility of seeing content of him via her connections to his sisters.

Ultimately, none of our participants who disconnected from their ex on SMSs retained connections with the ex's family.

In contrast, decisions around whether to maintain connections with the ex's friends and mutual friends were more complicated. We discuss these next.

4.4.3 The Ex's Friends and Mutual Friends. Participants talked about two different categories of friends: friends of the ex and mutual friends. When deciding what to do with these connections, participants rarely had concerns about remaining connected to mutual friends. However, connections with the ex's friends presented interesting challenges.

In contrast to the family members that our participants' described disconnecting from, they often refrained from disconnecting from friends. Our participants thought carefully about how the technical actions that accomplish disconnecting might be interpreted by the person on the receiving end of the action (e.g., what would the person who is unfriended on Facebook think of being unfriended).

Some actions would render the disconnection visible – that is, they could be noticed by the individual the action was being done on. For instance, unfriending on Facebook or unfollowing on Instagram would decrease the quantified number of connections that someone has, and reversing this action would result in a notification (i.e., to re-follow on Instagram would generate a notification that 'N has followed you', thus rendering the original disconnect visible). For Kristine, choices around connections were directly impacted by the visibility that reconnecting would cause:

I feel like if I unfollow them then I can't, you know, go and refollow them. They're going to get the notification and be like, 'Why is she refollowing me?' (Kristine)

Other visible actions included blocking, which decreases the quantified number of connections and makes it impossible to find the disconnector's profile. In contrast, invisible actions are actions that are not readily apparent or cannot be figured out by the individual upon whom the action is done. Actions like unfollowing (Facebook) or muting (Instagram) were invisible – there is no change to the disconnectee's view of the disconnector's account or their quantified number of followers. Only by careful inspection could one realize that action had occurred.

Regardless of the type of technical action taken on connections, it often was not done in the immediate aftermath of the break-up if at all. Instead, managing connections often occurred after possession management occurred. For example, Adeline changed her profile picture on Facebook within a day or two, Adeline deleted pictures within 24 hours, and Alex saw her ex-boyfriend change his profile picture just hours after their break-up conversation.

However, accomplishing similar actions with connections often took weeks or even months to occur. Recall Elisabeth, who disconnected from her ex's mother on Facebook months after her break-up, after she realized she did not need to see that person's social media updates any longer. In the wake of a break-up, participants attributed the lag between managing possessions and managing connections to a number of reasons. In the case of visible actions (actions that would render the disconnect legible), they worried about being 'cruel' as Adeline said:

I think probably a couple of weeks after because I didn't want to feel cruel. It feels very dramatic to me to delete someone, it feels final and serious, even if you know you could still reach out to them in real life. (Adeline)

Here, the 'cruelty' that our participants felt would result from visibly disconnecting is that it reinforces break-up. Recall Elisabeth, who grappled with the implications of unfriending her ex's mother.

In other cases, participants described not disconnecting. For example, Sabrina decided not to disconnect from anyone:

I'm still friends with all, on Facebook or whatever, with everybody in his circle. (Sabrina)

When asked why, Sabrina talked about her personal preference to not disconnect from anyone, and described her Snapchat contacts as being "a huge pile-up of people from my past." Yet others made conscious decisions based on perceived social relationships that extended beyond the romantic relationship. Take, for instance, Adeline, who described not disconnecting from her ex's best friend:

Actually, the only person I didn't unfollow [on Instagram] is his best friend just because I felt like he and I actually had our own relationship and got along very well and I feel like... not that I will seek out continuing to be friends with him, obviously, but if we ran into each other I feel like we would be good friends and I care about what's happening in his life (Adeline).

Adeline's rationale for not disconnecting from her ex's friend comes imbued with the understanding of how social relationships are collapsed into datafied connections – she acknowledges that she is not trying to continue being friends with him, but remains interested in seeing what he is up to. She continued:

I would have considered him a friend at the time we [Adeline and her ex] were dating, but I think if they're originally the other person's friend and they're very close... [If it were me,] I would want to be loyal to my friend... But I still think he's a cool person and I care about what he's doing in his life... (Adeline)

When they did disconnect, participants told us that they did not actively search out the accounts. Instead, they disconnected when they saw someone post something before doing anything to their connection with that person. Where possessions are straightforward – located in specific places,

and easy to discern what is or is not illustrative of the ex or relationship – connections are more nebulous. It might take concentrated thought, and even browsing of another’s profile, to recall who the person is and why they are a connection in the first place. Additionally, undertaking this labor could expose one to content about an ex through the pictures or stories that are on another’s profile, as many of our participants experienced. For example, Sabrina saw her ex appear in the background of a mutual friend’s Snapchat story. “I kind of freaked out about it,” she explained.

In the case of Kristine, the conflict between disconnecting with her ex’s friends (which she did not want to do) and the risk of encountering content about him resulted in her deciding to disengage with Instagram entirely. . Notably, Kristine knew how to disconnect from these people on Instagram, but did not want to; instead, she just did not want to run the risk of seeing something of her ex:

I have not touched Instagram since [shortly after the break-up] because I’m afraid that I’m going to see something that has him in it. (Kristine)

Once she learned that it was possible to mute mid-interview, Kristine was excited at the prospect of “getting Instagram back.” When it was pointed out that she would have to go to each person’s profile to mute them, she reasoned that she could be mentally prepared to see something about her ex-boyfriend during this process, unlike randomly coming across content about him in her Instagram stream.

Most of our participants, however, were fine with seeing content. Accordingly, it was also easier to conduct technical action (disconnecting, muting, etc.) as they appeared in a specific site’s feed instead of searching through a list of connections.

When participants did not disconnect from their ex or people close to their ex, it enabled that connection to persist past the point of the corresponding offline social relationship existing. If one happens to see an ex’s family or friends offline, the encounter comes with socially understood expectations that it should probably be awkward. However much two individuals liked each other (e.g., a boyfriend and brother playing video games together and becoming friendly), the new social role of being an ex-boyfriend dictates that the encounter should be somewhat uncomfortable, and perhaps avoided entirely when possible. However, online the expectations of space do not exist. On the contrary, the very nature of SMSs encourages users to remain connected to others, often inappropriately compared to offline expectations. Participants recognized this and struggled to reconcile the offline expectations with the ease that they could accomplish actions online (for example, Adeline).

Complicating these decisions is the design of the features and systems themselves. Where the actions that one can accomplish on online possessions were markedly similar to offline connections (e.g., deleting a picture corresponds to burning a letter), the actions that can be done with online connections do not align with how offline relationships are handled. For instance, not seeing an ex’s family in the wake of a break-up offline was a clear norm in our participants; online, however, that norm is not always explicit. From our participants’ experiences with managing connections, we see them being forced to think and act upon connections as if they are possessions. As a result of how nebulous, symbolic relationships are encoded into defined categories, our participants struggled with how to manage connections with functionality that often felt more appropriate for possessions.

The mismatch could lead to a sort of paralysis, as we heard from Kristine – an unwillingness to do anything. Moreover, even though platforms have added functionality to address the unique qualities of connections (e.g., muting), none of our participants were aware of these features. Instead, their approach to managing data on these SMSs – possessions and connection – was predominantly

informed by black and white actions associated with possessions (e.g., posting, deleting) and little support for the nuances that define relationships after a break-up.

5 DISCUSSION

In the wake of their break-ups, our participants were left with online possessions that were indicative of the relationship and online connections that left them tethered to their ex when they were unsure if that was appropriate or not. Our participants described using technical features to manage these remnants to create a post-break-up identity and online audiences that might help them grow from the break-up.

The tools and features our participants used technically achieved their goals, however, the tools failed to respect the social norms and etiquette that they felt accompanied removing possessions or disconnecting from others online. The resulting tension between technical achievement and violating socially held norms presented issues for our participants, sometimes to the point of them deciding not to use features that could help them. Even when they decided to utilize the management tools available to them, they still struggled to reconcile the ease at which the actions were technically accomplished against the perceived social weight of those actions.

In this section, we analyze our participants' experiences through two lenses. We start by arguing that the ways that connections exist and are managed is similar to possessions. Turning to the framework for sociotechnical representation that Brubaker & Hayes [14] proposed (based on [2]) to consider how the representations of possessions and social connections on SMSs shape the experience of a break-up, and how features meant to manage possessions are not well suited to manage connections. Based on our analysis, we offer design implications for better representing relationships to others online and providing better tools for managing those connections.

We then turn to Hogan's [48] framework of online identity as an exhibition to examine the decisions our participants made as they relate to their post-break-up identities. In our participants' experiences, we see them thinking carefully about the kind of online identity they wanted, and making possession and connection management choices based on those desires. We extend Hogan's framework, positioning people as curators, submitters, audiences, and the exhibition itself, and suggest designs that might better empower people in this curatorial work during and after life transitions.

5.1 When Connections Are Possessions

When analyzing how our participants managed connections online, the need for explicit actions and how relationships were encoded into data resulted in management practices that resembled possessions more than offline connections. Brubaker & Hayes [14] outline eight features of computing that are of interest when considering computing as a representational practice. We focus on ontology, standards, performance, and authentication, as they capture the nuances around how people manage remnants represented through data standards and adjust their practices with these representations in mind. Analyzing our participants' experiences through this conceptual lens enables us to see how connections are operationalized in systems as possessions, replete with features that act on connections in a possession-like way, and illustrates possible design solutions to remedy the problems that connections present.

5.1.1 Ontology. The ontology of a given SMS defines what can be captured and thus represented computationally. Yet, the fundamental premise of social media – to connect us – is inherently simplified within the ontology of these systems to the point of being reductionist [14].

The ontologies of current SMSs do not capture much of the nuance that exists in our human relationships. Instead, connections are simplistic: On Instagram, one is a follower or is followed,

regardless of if offline they are a lover, mother, brother, or lifelong friend. The simplification of our relationships when they are encoded into connections remains similarly rigid in the midst of a life transition. Offline, a break-up can come loaded with a raft of social implications like a change of status in someone else's life. But online, it remains follow and be followed – either you are connected or you are not, which may not accurately reflect how the relationship has changed offline.

Additionally, the nature of our SMS ontologies renders connections as something to be collected, like possessions. SMSs quantify the number of connections one has on the platform – *i.e.*, how many Friends or followers one has on Facebook and Instagram, respectively. They also have features that encourage us to connect with more people, even people who we may only have the most tenuous of connections to online. In the aftermath of a break-up, one might be left with numerous connections that are no longer relevant, but still leverageable by the system as data to populate algorithmic features.

The oversimplification of our relationships has a further consequence, beyond the inherent difficulties posed by simplistic connections. Returning to the definition of ontology in this framework, “a computer can only capture and calculate what it can represent” [2]. Without capturing the nuance of our relationships within the calcified data connections, algorithms cannot be attuned to the human needs and desires that might exist in the wake of a life transition like a break-up. In turn, this leads to upsetting and unexpected encounters in reminiscence systems, like those studied by Pinter et al. [78]. For instance, while a user might be able to ask Facebook to “Take a Break” from showing content about an ex, the system is unable to understand that it is likely inappropriate to suggest that an ex's new partner might be a “Person You May Know.” The ontologies of SMSs are not designed to capture the web of relationships that might continue to connect to people long after the 1:1 connection between them has been severed.

5.1.2 Standards. The experiences of our participants revealed how technical standards deeply complicated the process of breaking up – our encoded connections are computationally leveraged much in the same way as digital possessions. Disconnecting (*e.g.*, unfollowing on Instagram) came loaded with the same social considerations that deleting an online possession would: “is this cruel to my ex?”

While there are many possessions that might remain on a given platform after a break-up, there is but one connection between two people. Moreover, the nature of our relationships being simplified into a connection means that the online connection can be incredibly nuanced, representing not only a romance (or failed romance), but also the friendship that came before, or a desire to pick the friendship back up after the relationship is over. Thus, the standards that render connections as just another data entry to manage after a break-up flatten the uniqueness of that connection.

Finally, connections in SMSs are represented as static relationships that we create and may later delete.

However, the experiences of our participants illustrate that social relationships are more fluid. For instance, Adeline did not want to disconnect from her ex but also did not want to see anything he posted. She was left with few options to enact what she desired on the connections she had to her ex and his family and friends.

Providing tools and feature sets that conceptually operate on a connection as if it is a possession fails then, because people may only want to manage a specific context that is part of that connection, not the whole connection.

5.1.3 Authenticity. Brubaker & Hayes argue that the task of evaluating the authenticity of information falls to the end-user. In the case of our participants, they thought carefully about how someone viewing their profile might interpret their identity – particularly their relationship status. Some

participants, anticipating this, removed and edited posts and profile information to ensure that an observer would not think they were still in a relationship with their ex. Others did not do any sort of possession management, leaving possessions that are indicative of being in a relationship with someone, and assumed that people would either not see those possessions as newer ones were posted, or be able to accurately interpret those possessions (and the relationship) as being the past, not present.

The choices made by our participants illustrate a shortcoming in how portions of our identity are translated into and represented by data – what one person might find appropriate in the wake of a life transition might be wholly inappropriate to another. Alternatively, differences in ideologies around what to do with possessions might lead to misinterpretations when looking at someone’s profile, creating awkward moments stemming from misauthentication and misunderstanding. In other words, people are placed into the position of having to anticipate how others might interpret the identity being presented on their profile and may have to deal with problems when those interpretations are incorrect. Designers could remedy this by providing cues that help audiences understand context, or enable better filtering to specific audiences for possessions that might present a particularly complicated identity.

5.1.4 Performance. Brubaker and Hayes argue that performance entails “people becom[ing] aware of and accustomed to having their activities presented to others through representational systems... [and altering] their activities with the consequence of those systems in mind” [14]. We see performance clearly in the curation of possessions to appear single online.

Other types of performance influenced how our participants’ presented their activities online in the wake of their break-ups. Knowing that they were still connected to their ex or their ex’s family and friends led many participants to not post about dates or new partners they were seeing. Reminiscent of context collapse, in which content meant for one group is seen by another [62, 65], our participants told us of performances that were less authentic to who they currently were because of a small segment of their online audience.

Across these facets of computing and representation, we see tensions spring up from the simplification of our lived experiences into data. While the experiences of our participants illustrate how the practices of managing physical possessions translate well into managing digital possessions, the same cannot be said for offline relationships and online connections.

As Brubaker & Hayes demonstrated [14], when systems have simple representational approaches to their design, users make up the difference – inferring connections, relationships, and pasts, just as our participants described. However, in a light-representational system, the use of a workflow might provide the necessary structure to help people reconfigure their social media. For example, Instagram might develop a more robust workflow when people are going through a break-up, prompting people to consider categories of relationships they may want to unfollow or mute – even if the user would have to search for these people in a list. One might imagine a workflow that asks a user to identify their ex’s account, asks the user what they want to do with photos, and encourages them to think about people that they might want to unfollow. Such an approach might have the added benefit of providing platforms with data that algorithms could leverage when generating recommendations for content or connections.

Of course, such a workflow might be based on some normative case, excluding edge cases or those who are marginalized in some way. Moreover, encouraging people to think about who they are connected with and why could cause people to act rapidly and irrationally in a way that might be inappropriate – for instance, deleting an ex and their family quickly after a break-up might preclude opportunities for getting back together if the break-up was only meant to be temporary.

5.2 An Exhibition, but to Whom?

Our participants made decisions about their self-presentations online after their break-up. In these decisions, like deleting possessions or disconnecting from others, we turn to Hogan's exhibition approach and view our participants' actions as those of a curator. Hogan identifies three functions that curators leverage online: filtering, ordering, and searching [48]. These functions can be used to highlight or obscure content, according to the curator's goals. In Hogan's definition of the curator and the exhibition, we see him arguing for the existence of a curator who manages (via filtering, ordering, and searching) content submitted by a group of submitters, creating an exhibit that can be viewed by an audience. Each of these people or groups are separate and different from each other – for Hogan, curators are algorithms.

In our participants' experiences, however, we see them occupying several of the roles simultaneously. Recall, for instance, the experiences of Henny. Henny told us that she did not disconnect from her ex-girlfriend, but did delete many of the digital possessions that had her in them or were indicative of their relationship. She reasoned that she was attempting to have an online identity that was representative of who she was at that moment, and what she valued or believed in. Her ex-girlfriend, for perhaps obvious reasons, was not to be part of that identity after their break-up.

Henny's description of her decision-making places her in several of Hogan's roles simultaneously. She is clearly acting as a curator, making decisions about what should or should not be exhibited. She is concurrently the exhibition – the online representation of who she is – and the submitter, making content available to herself to curate. And in a specific case, she is the audience to a certain type of exhibition: an exhibition to an audience of one, created when possessions are not deleted, but rendered "archived" or otherwise unviewable by her general social media audience.

As a curator then, we can classify Henny's philosophy – she a curating an identity presentation that is present- or future-facing. We refer to individuals with this philosophy as **revisionist** curators.

In contrast to Henny, there was a second curational philosophy evident in the decision-making some participants went through. Exemplified by Adeline, there were participants who curated in a more past-facing mindset. Adeline did not delete any possessions; the only possession management she did was to change her profile pictures from ones with her ex in them to ones of just her (and even those weren't deleted). Where Henny was thinking about her future and presenting the best identity she could for future connections, Adeline thought of her online identity as the sum of everything she had experienced to that point. Thus, Adeline's philosophy was one that is past-facing or archival in nature, and she was acting as an **archivist** curator.

Archivists faced a self-presentation problem that revisionists did not – a risk of audience misinterpretation. Revisionists, doing possession management, rendered potentially confusing or upsetting possessions invisible to the audiences of people and algorithms online. Archivists, on the other hand, leave their possessions available. Human audiences can still view them, and potentially misunderstand one's past identity as being of the present. Algorithmic audiences can still leverage them as part of reminiscence features, potentially exposing the archivist to unexpected or upsetting moments of reminiscence.

Regardless of curational philosophy – revisionist or archivist – the tools available to individuals to do their curation were limited. When making decisions about their possessions, our participants were left with the option to delete, to archive, or to do nothing, as we previously described. Each of these actions is a type of filtering. The other functions identified by Hogan are either system-defined or limited in scope by the system. Ordering is done automatically by SMSs, placing possessions in reverse chronological order (newest to oldest). Searching is limited to what the system can parse

from individual possessions. For example, one can search Instagram broadly for 'Top', 'Accounts', 'Tags', and 'Places', but it is not possible to search within an individual profile.

Hogan does not make explicit reference to where the "exhibition" in his framework comes from. But turning to a common locale for an exhibition – the museum – might prove generative in identifying possible actions that designers could consider offering users in their curatorial activities.

Museums frequently evaluate their collections and make decisions about what is worth continuing to store and what should be sold, a practice referred to as deaccessioning [71]. One could imagine a reminiscence system in SMSs that encourages people to re-visit their archives – the digital equivalent of evaluating and deaccessioning artifacts. The approach of reevaluating possessions through reminiscence contrasts with Mayer-Schonberger's argument that data should come with expiration dates [66], instead aligning with Sas & Whittaker's [89] call for designing for forgetting. Our participants wanted to evaluate their possessions, and for some reclaim them. Thus encouraging deletion via reminiscence might enable people to create the space that they need to heal from a break-up and then return to those possessions later to make more rational decisions about what to do with those possessions, something that building inherent expiration dates into would render impossible.

Alternatively, instead of conceptualizing the archive as a separate place within a user's profile, designers might recreate the archive as an integral part of the public profile. The museum curator has a more holistic view of the museum than the general public might – they can see what is being exhibited currently, but also what is held in storage. With our positioning of the user as a curator, it is easy to imagine a feature similar to Facebook's Take a Break, but for possessions that are posted to one's profile. Setting the profile to hide certain possessions for a period of time, and then returning them to the profile after that time elapsed might encourage people to make better use of features that are not deletion.

5.3 Limitations and Future Work

All research comes with inherent limitations, and the work presented in this paper is no exception. In this section, we discuss some of the limitations of our study and use those limitations to motivate future work.

While our inclusion criteria for this study were open to individuals from various identities (e.g., gender, sexuality, race, etc.), our sample was overwhelmingly white, cisgender, heterosexual women from the United States. With literature from other disciplines illustrating how demographic characteristics can impact relationship dissolution (e.g., [47, 53, 97]), future work on break-ups and social media should consider a more varied sample group.

Notably, our sample limits the generalizability of our findings to women, and so future work should investigate men's experiences with possession and connection management in the wake of a break-up. Psychologists have long paid attention to gender differences in how people break up and handle the aftermath of a break-up, and a more diverse sample might find effects that mirror this literature. Additionally, in line with CSCW and more broadly SIGCHI's focus on marginalized and underrepresented experiences in computing and the impact of intersectionality, work should investigate the experiences that queer, trans, and non-binary people have when they experience a break up. The experiences of people who identify as queer, trans, or non-binary could be significantly different.

Additionally, our inclusion criteria did limit our sample to individuals who had not been married, had not had children together, and were geographically proximate to their ex for a majority of the relationship. Similar to demographic characteristics, these factors have all been shown to contribute to how and why a relationship might end, and contribute to the need to remain connected on social media (e.g., to share pictures of a child with an ex or ex's family). Accordingly, the suggestions

presented here may be less applicable for relationships that ended in divorce, resulted in children, or were long-distance in nature. Future work could investigate individuals in these groups, who likely have different needs than people going through a “regular” break-up.

Finally, our participants took part in our study well after their break-up had occurred; in some cases, up to 15 months after the break-up. Thus, participants may have had time to reflect on what they had experienced and how they had handled their break-up. Additionally, we only interviewed half of the failed relationship, meaning that their descriptions of the relationship, break-up, and aftermath are almost certainly biased. Future work could consider striving to interview both halves of a couple after a break-up, or investigating what people would want before a relationship ends (*i.e.*, interviewing couples who are still together).

6 CONCLUSION

In this paper, we investigated the experiences of people who had recently gone through the break-up of a romantic relationship. We found that people are left with possessions and connections after a break-up and that managing the online versions of these can present difficulties when attempting to create a post-break-up identity. Using Brubaker & Hayes’s framework of computational representation, we identify issues in how possessions and connections are translated from offline to online environments. Examining the actions our participants took through Hogan’s exhibition of identity framework, we extend the framework further to suggest that curation is not just an action of algorithms, and argue that tools should be better suited to letting people curate more accurate representations of who they were and who they will be.

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