I'm Working on Erasing You, Just Don't Have the Proper Tools: Supporting Online Identity Management After the End of Romantic Relationships

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After a break-up, people are left with data representative of their lost relationship – pictures, posts, and connections that exist because of that relationship. As part of breaking up and moving on, people often make decisions about managing that data. Prior work has identified two broad types of curatorial philosophies people adopt in data management: archivists and revisionists. However, what drives individuals to one approach remains unknown and is difficult to design sociotechnical systems for. Through focus group interviews with couples still together, we present a decision-making framework for data management. We outline factors that can influence individuals' decision to act as an archivist or revisionist in the wake of a break-up. From our data and framework, we identify six implications for design to improve user experiences in the wake of a break-up, and from those implications, offer concrete suggestions for design for social media platforms.

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

ACM Reference Format:
Anthony T. Pinter and Jed R. Brubaker. 2024. I'm Working on Erasing You, Just Don't Have the Proper Tools: Supporting Online Identity Management After the End of Romantic Relationships. *Proc. ACM Hum.-Comput. Interact.* 8, CSCW1, Article 66 (April 2024), 32 pages. https://doi.org/10.1145/3637343

1 INTRODUCTION

Romantic relationships end. Regardless of the type of relationship, chances are excellent that for any given relationship, it will end. For example, a common adage in the United States is that over half of marriages end in divorce [1]. When relationships end, formerly intertwined individuals must disentangle themselves from one another. Depending on the type and length of the relationship (amongst other variables), disentangling may include deciding who owns items bought or gifted, finding new places to live apart, or even filing legal paperwork.

Once disentangled, however, it can be possible not to see or even be reminded of one's ex-partner again in the physical world. Friends and family often adhere to social norms around not talking about a break-up unless brought up by the individual who had the break-up. One can hide pictures

[1]The actual number is extraordinarily difficult to calculate; most estimates place it at somewhere between 2 and 5% in a given year [5].

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2573-0142/2024/4-ART66
https://doi.org/10.1145/3637343

and other sources of memories, or those things can be "reclaimed."[2] Alternatively, the physical residue of a lost relationship might instead be destroyed [8, 50].

However, the data that represents a lost relationship remains readily available online in the wake of that break-up. These data remnants can present challenges that are absent with offline objects. For example, determining who owns a posted photo remains a contested issue [58], even when not considering the additional emotions that might be involved in the wake of a romantic relationship ending [17]. Moreover, handling physical possessions can be done privately, with the outcomes less apparent to a third party. In contrast, the data management actions one might undertake online are more legible to one's audience(s) and could create awkward moments. Consider, for example, one realizes their ex has unfollowed them on a social media site like Instagram.

However, managing data remnants might be necessary regardless of any awkwardness it may cause. Data that persists on social media beyond the end of a relationship — like photos together — may present an unwanted identity to one's online audience (*e.g.*, [65]). Thus, it may be imperative to manage that data as part of the break-up process, removing or obscuring it to present a new identity of being single. The desire or necessity of managing that data, up to and including deletion, sits in tension with platforms' and users' desires to use sociotechnical systems as personal archives [3, 45].

Even when people manage their data to make it illegible to their networks, that data may remain legible to the algorithmic audiences on social networking sites (SNSs). Work has called attention to how algorithms can leverage data to make recommendations [4, 54], and how those recommendations could improve user experiences. A specific type of recommendation prominent on social media sites is reminiscence — features that encourage users to view photos and posts from their past [42, 48]. While research has demonstrated the positive impacts of these features on well-being when algorithms leverage the data remnants of a broken-up relationship to recommend new connections or encourage reminiscence, it can be upsetting [66]. Akin to unexpectedly seeing an ex in the offline world, an unexpected moment of algorithmic curation could impede one's ability to heal from and move on after a break-up. For example, seeing the reminder of the beach vacation that one took with their (then) significant other can prompt reminiscence that might be negative – causing the individual to miss their ex-partner and desire to reconnect with them in a way that might be inappropriate or harmful to "moving on" [66].

Approaches to data management and identity in the wake of a break-up have focused on how individuals react to a generalized break-up. Yet, break-ups take many forms and occur for many reasons. While the outcome may be consistent — the end of a relationship — the way that each break-up plays out is unique to the individuals experiencing it. Accordingly, taking a more comprehensive approach to break-ups and acknowledging the impact that the type of break-up may have on subsequent data management practices is important in designing features that support this diversity of experiences.

In this paper, we explore post-break-up identity by studying what people would want to do with the data remnants of their relationship if their relationship were to end. Through 4 semi-structured focus groups with 8 couples who were still together (16 total participants), we identified post-break-up data management concerns and factors that might impact one's decision to act upon data. Building upon prior work, we map these considerations onto an exhibitional framework of online identity [41] and Pinter & Brubaker's "archivist" and "revisionist" taxonomy [65]. We argue that archivist curators are more concerned with the sum of their identities and past experiences. In contrast, revisionist curators pay more attention to creating identities that are accurate to who

[2] Anecdotally, the first author was wearing a shirt that an ex-partner gave him for his birthday while writing this sentence, but he generally does not associate the shirt with his ex anymore; it's just a nice shirt.

they are at that moment. Paying attention to the impact that the type of break-up might have on data management practices, we identify four broad factors that can impact one's decision to act as an archivist or revisionist in the aftermath of a relationship ending.

Based on our findings, we introduce a decision-making framework for individuals who conduct data management in the wake of break-ups. Based on this framework, we then identify six design implications and discuss possible designs that would fulfill the design implications and improve user experience in the wake of a break-up.

2 RELATED WORK

We situate our work, focused on the dissolution of romantic relationships, within the larger literature around life transitions and identity. We discuss the role of technology and algorithms in supporting identity presentation online in the wake of experiencing a life transition and then pay specific attention to these issues in the context of relationship dissolution. Then, we discuss the research questions that motivated this work.

2.1 Life Transitions, Identities, and Algorithms

Our lived experiences are bound up with and constitutive of our identities. Consequently, these identities are malleable and might change in reaction to changes in our lives. Called "life transitions", these changes impact one's life in a significant way and require reconstituting one's identity in response [49]. Life transition is a necessarily broad term — Haimson et al. identified 121 types of life transitions, spanning 12 categories (health, financial, relocation, legal, relationships, family, death, career, education, lifestyle, identity, and societal) [35]. Moreover, they argue that these life transitions can impact one's identity when experiencing a life transition and when those close to an individual experience a life transition. Consider, for instance, the death of a loved one — a transition that impacts not only the deceased individual but also those close to that person [15, 47].

HCI researchers have examined the role of technology in life transitions across many of the experiences and categories captured in the major life events taxonomy. These include studies on death (*e.g.*, [14]), education and education adjacent milestones (*e.g.*, [24, 62, 74]), lifestyle changes (*e.g.*, [25, 72, 73], health (*e.g.*, [6]), and identity (*e.g.*, [33, 34, 67]) among other types of life transitions.

Across these different types of life transitions, work has drawn attention to the dual nature of technology in these experiences. Technology can offer support and community to individuals going through a life transition but could simultaneously hinder one's ability to move past the life transition. For example, Pinter et al. [67] examined trans and/or non-binary people's coming outs online, finding that social media enabled the sharing of new identities to large numbers of people but simultaneously increased the risk of context collapse and subsequent adverse reactions from unsupportive audiences online as a result of that visibility.

As our lives have become more represented by data and leveraged in sociotechnical systems like social media, people have to contend with the offline impact of a life transition and how their online identities might be affected. Haimson [31] introduced *social transition machinery* to account for the impact of having multiple identities across multiple social media platforms. Social transition machinery describes how this multiplicity of identities and platforms enables individuals to move through life transitions in ways that avoid negative outcomes. However, Haimson's social transition machinery fails to account for the datafied remnants of past identities that might remain available after a life transition. While some remnants may be allowable and even desirable — for instance, photos from college — others might represent identities no longer congruent with one's current identity, like a post expressing appreciation for an ex-partner.

Not only are such remnants available to one's audiences online, but they are also available to the algorithms that comprise systems that suggest, curate, and encourage reminiscence. When a past

identity is no longer accurate or desirable, these systems can remind users of them in ways and at inappropriate times.

Hogan's [41] exhibition of identity accounts for the "algorithmic audience." Building from Goffman's dramaturgical approach to identity [29], where identity performances occur in synchronous scenarios, Hogan argues that such performances are inadequate to explain identity self-presentation online. Hogan proposes the asynchronous exhibition of identity to remedy this problem, labeling algorithms as 'curators' that show audiences different data about the individual.

The exhibitional approach to identity places the individual on display as part of an audience or audiences, and places agency around what content to show in the hands of algorithms, that "selectively bring artifacts out of storage for particular audiences" [41]. However, Pinter & Brubaker [65] argue that the individual on exhibit also has agency in determining what is part of that exhibit. Human curators can leverage data management tools like deletion and muting to facilitate what types of content the algorithmic curator has access to. Pinter & Brubaker identify two types of human curators — the archivist and revisionist, and highlight how features designed to support one might inhibit the other in the wake of a life transition.

After birth and death, one of the most ubiquitous life transitions might be experiencing the end of a relationship with another person. Throughout life, one has many different types of relationships with many different people. Romantic relationships are of particular importance to people. To consider the diversity of break-ups, the needs of people following these break-ups, and the impact of data management on their well-being, we turn to social science as our foundation in the next section, where we discuss the end of a romantic relationship as a particularly nuanced type of life transition.

2.2 Romantic Relationships and Break-ups

Scholars have studied the many types of romantic relationships that people have: legally recognized marriages, long-term relationships, long-distance relationships, cohabiting relationships, polyamorous relationships, and relationships that are short in length, like a high school or college fling. HCI, in turn, has studied how technology can play a role in forming and maintaining these relationships. For instance, work has examined how technology might support long-distance couples in feeling closer, combating the strain the geographic distance can place on a relationship (*e.g.*, [7, 63]). Elsewhere, scholars have examined how dating apps can introduce people to potential partners they might have otherwise missed [19]. Once relationships begin, work has considered the dynamics around digital sharing within relationships (*e.g.*, [43, 53, 60, 64].

In recent years, researchers have begun paying closer attention to technology's role in forming and maintaining relationships and at the end of relationships. Research has examined disclosure ideologies in the wake of break-ups [33, 68], disconnecting behaviors [52, 79], and possession management [37, 61, 71].

Across this new interest in relationship dissolutions, HCI researchers have focused much of their attention on divorces or non-divorce break-ups. The work in this area has yielded generative empirical findings and design suggestions. For instance, Herron et al. [37–39] found that digital possessions can be 'tainted' with the memory of an ex or relationship and suggested designing around guilt as a possible avenue for creating features that are helpful in the wake of a break-up. However, the categories such as "divorce" and "non-divorce" are so broad that they might fail to capture particular nuances specific to different types of break-ups. For instance, Dailey et al. [22] identified five types of "on-off" relationships — relationships that end and renew — illustrating the diversity of break-ups.

In other words, prior research might be missing the reasons that these relationships end, the impact those reasons might have on how the relationship ultimately dissolves, and how they could

change post-break-up behaviors and, ultimately, recovery (*e.g.*, [23]). Turning to work from other disciplines, such as social psychology, we see researchers taking more nuanced approaches to understanding break-ups. Machia & Ogolsky [57] identified 11 reasons for relationships to continue or end ("reasons to stay" and "reasons to leave"). Bound up in these reasons — like "Alternatives: new relationship", "Personal need fulfillment" and "Commitment" — are more nuanced explanations for why relationships might end. They quantified the reasons as either strong or weak in relation to staying or leaving a relationship. For instance, a relationship that ends because of infidelity could be because of a lack of commitment (a strong reason to leave) or the interest in the alternative of a new relationship with someone else (a weak reason to leave).

Further, the body of work from HCI focused on relationship dissolution has taken the approach to understanding the break-up and how the people involved handled the break-up process after the break-up occurred. Work has identified correlations between space and recovery (*e.g.*, [51]) and found that people who remove stressors — like posts or connections — have an easier time recovering and moving on from the break-up [12, 68]. However, memory can be flawed, so turning to an approach informed by pre-planning — encouraging people to think about how they might handle a life transition before it occurs — may yield insights that retrospective approaches miss.

2.3 Research Questions

Building upon prior work, the work presented in this paper was guided by a series of research questions.

First, while retrospective approaches to understanding people's decision-making during a life transition are robust, speculative approaches might yield complementary insight into how people think about management before having to do so in an emotional and stressful time. The drawbacks of retrospective approaches to this topic are echoed by related work from psychology, calling for prospective approaches to break-ups (*i.e.*, exploring what people might do if their relationship ends) [57]. Accordingly, we invoke the concepts behind pre-planning (*e.g.*, [46]) and take a proactive approach in studying relationship ends as a means to remedy the gaps in knowledge related to data management and identity (re-)constitution in the wake of a romantic relationship ending. (*i.e.*, during the break-up). Our approach here motivates our first research question:

RQ1: How do people think about and plan for their post-break-up identity before a break-up occurs?

Next, as discussed, prior work on relationship dissolution in HCI has approached the type of relationships studied through a binary lens – either they were divorces or non-divorce break-ups. Yet, work from other disciplines shows that both kinds of break-ups are more nuanced whether the relationship was legally recognized. The discrepancy between HCI and other fields motivates our second research question:

RQ2: How do the circumstances in which a relationship ends impact the type of post-break-up identity that one might create after a break-up?

Accordingly, in this paper, we focus on non-divorce break-ups. We approach this type of relationship dissolution as not one type of experience but an experience of many different types. We outline three types of break-ups — mutual break-ups (the break-up that comes about when both partners decide the relationship is no longer right, or the amicable break-up), the break-up that results from infidelity (cheating), and the break-up that comes from "falling out of love" or realizing that the relationship is no longer right for an individual (a one-sided break-up, where one partner wants to continue the relationship but the other does not), to capture a broader scope of the reasons

and ways a relationship might end. We draw these types from the reasons a relationship might end identified by Machia & Ogllsky [57] and elaborate further in our Methods.

Taking a speculative approach to break-ups – speaking to people still with their current partner – we investigated how individuals still in relationships thought they would manage their data in three break-up scenarios. Our work here builds on the prior work discussed above by approaching break-ups as something that can be thought about in advance of actually occurring and offers design considerations that could enable individuals to enact data management and constitute their ideal post-break-up identities if and when they experience a break-up of a romantic relationship.

3 METHODS

We conducted a series of semi-structured focus groups with couples in romantic relationships. As a research team, we approached this topic space with similar experiences to many – having been in relationships that failed for various reasons and being on the giving and receiving end of a break-up. But across all of these scenarios, our experiences were littered with digital complications like the ones described by our participants.

In this section, we describe our recruitment of participants and the participant couples who took part in our study. Then, we describe how we collected data and the types of data that resulted from our focus groups. Finally, we discuss our analytic approach to that data. Our study and research materials were reviewed and approved by the University of Colorado Boulder's institutional review board (IRB protocol #20-0588).

3.1 Participants

We recruited participant couples through social media posts and classroom recruitment at a large public university in the United States. We used a web form to check that participant couples met the inclusion criteria for participation and to collect their emails if they met that criteria. The first author coordinated with participant couples to schedule focus group meetings. For participating, each participant couple received $100 ($50 per person) as compensation.

Both people in a couple had to participate in the study to be eligible. Participants had to be between 18 and 30 years old and be active on at least 2 social media sites. Because age is a contributing factor to how relationships end (*e.g.*, [26, 69]), we limited our sample to participants under 30 to focus on people who have always had social media. This sampling decision aligns with prior work on social media and break-ups [39, 65].

Participants had to have been with their partner for at least 6 months, and their relationship could not have resulted in marriage or children. Longevity of a relationship, the presence or absence of children resulting from the relationship, and the ease (or lack thereof) with which a relationship can be ended have been shown to impact decisions around ending a relationship (*e.g.*, [16, 20, 40, 44, 76]). For instance, the legal issues of a divorce can complicate the breaking up process [40]. Likewise, children may complicate decisions around remaining connected with an ex on social media sites [66]. Our exclusion criteria were designed to ensure that these complicating factors would not be present – participants would have no outside reason to stay connected (*e.g.*, children).

Our participants included 8 couples (16 total participants). To protect participants' identities, we assigned each participant a pseudonym and refer to them as such throughout this paper. Our sample was predominantly straight (n=14), with one participant identifying as queer and one as pansexual. Participants identified as cis-men (n=8), cis-women (n=7) and non-binary (n=1). Participants were between 20 and 28 (m = 23.31; sd = 3.14) and had been together between 1 year and 6+ years (m = 2.95; sd = 2.09). All couples lived in the United States, and all but one couple (#5) were originally from the United States. We report demographics for each participant couple in Table 1.

Couple	Relationship Length*	Participant	Age	Gender	Sexuality
1	2	Bernie	27	Man	Straight
		Theresa	27	Woman	Straight
2	6	Leon	28	Man	Straight
		Elsa	28	Woman	Straight
3	1	Danny	21	Man	Straight
		Emilie	22	Woman	Straight
4	2	Braden	27	Man	Straight
		Ellie	26	Woman	Straight
5	5.5	Ramesh	25	Man	Straight
		Puja	23	Woman	Straight
6	1	Tom	21	Man	Straight
		Corinne	20	Woman	Straight
7	5	Henning	20	Man	Straight
		Matilde	20	Woman	Straight
8	1.1	Sherman	20	Man	Queer
		Cat	20	Non-binary	Pansexual

Table 1. Relationship Information and Participant Demographics
**Relationship length reported in years.*

3.2 Approach

Couples participated in semi-structured focus groups that lasted between 60 and 90 minutes. Adopting a focus group approach enabled us to tap into different perspectives from participants and for participants to build upon others' responses. Our approach aligned with Boddy's definition of a focus group discussion rather than a focus group interview in that we encouraged participants to discuss questions and topics of interest amongst themselves rather than individually [9]. This approach also worked to lessen the potential harm that could result from discussing "how you might break up with your significant other" with individuals who were still together. Focus groups have been used to explore sensitive topics, with researchers arguing that the group dynamic of a focus group can encourage disclosure [21] and provide an empowering environment to share thoughts [36]. Interviewing couples individually might have made it difficult for them to share their opinions in front of their partner; it may be easier to do so in the presence of another couple. An added benefit of using focus groups was that participants often seized upon what another participant discussed as something they might do if their relationship ended. While participants' thoughts converged on specific topics, differing opinions were also present within focus groups and even within particular couples. We detail this in our Findings.

We did not ask participants specifically about what they did with data in the wake of prior break-ups they might have experienced – prior work has adopted this retrospective approach [38, 39, 65, 66]. Instead, our approach here aligns with Machia & Ogolksy's call for recruiting participants who are still in relationships and who are not explicitly considering breaking up with their significant others to understand the differences between forecasted and actual reactions to experiencing a break-up [57]. However, many participants drew on past break-up experiences they had had with prior significant others when articulating responses to questions. What happens during an emotionally charged time (*e.g.*, a break-up) may be different from what was planned.

In total, we ran four focus groups in October 2021 via Zoom. The lead author facilitated each focus group, guiding discussion with prompting questions and clarifying points that participants made with follow-up questions. Each focus group had two couples and followed a two-part protocol.

(1) **Introductions and Rapport Building** — participants introduced themselves, their partner, and their relationship. Participants were asked to bring and share a meaningful digital possession they had as a result of their relationship and a digital connection they had as a result of the relationship. Participants were also asked to share a favorite memory of their partner or relationship as a way of underscoring that the later parts of the focus group that discussed break-ups were purely hypothetical and that they were with their partner for a very good reason.
(2) **Break-up Scenarios** — participants were asked to imagine what they would do with their digital data (*e.g.*, the previously discussed possessions and connections) if their relationship with their partner ended because of one of the following broad reasons: 1) mutual, amicable ends; 2) infidelity; 3) falling out of love (a one-sided break-up). We drew these broad scenarios from the experiences participants discussed in prior work [65] and the scenarios index onto the 11 reasons to remain in or end a relationship identified by Machia & Ogolsky [57]. For example, in scenarios 1 and 2, we asked participants how their decisions might change if it were them doing the infidelity/break-up versus if it were their partner – infidelity can result from the desire for a new relationship or new type of relationship, relational need fulfillment, or personal need fulfillment, and falling out of love maps onto satisfaction, love, and investment (or, more appropriately, a lack thereof). Participants were also asked what they would want their partner to do with their data in each scenario. When discussing preferences for their data, we presented participants with paper prototypes that illustrated how certain social media features (*e.g.*, archiving, accessing an archive, managing a connection) currently work. We used these prototypes to prompt conversations around both the utility and limitations of those features. These prototypes were used with the break-up scenarios to motivate participants to discuss how they would manage their data and how they would want their partner to manage their data if they broke up.

Focus groups were semi-structured in nature, and we designed our protocol to prompt participants to discuss amongst each other what they thought and what they might want in the aftermath of a break-up should it occur. As participants shared their thoughts and opinions, we asked follow-up questions to delve deeper into why they might make certain decisions and how they might feel during and after their break-up.

Bearing in mind the loaded nature of the focus group setting and topic, we had procedures in place to help minimize the risk that participants might face from participating. Specifically, we were careful to highlight that the scenarios were broad characterizations of how relationships could end and were hypothetical. Finally, we were sensitive to signs of distress [13], and resources for mental health and counseling services were available should they be needed.

3.3 Analysis

We analyzed the transcribed data from the focus groups in a two-round coding process. The analysis process occurred throughout data collection (*i.e.*, interviews were transcribed and coded, and code memos were written while interviewing was still occurring). The simultaneous nature of the interview and analysis process and our specific inclusion/exclusion criteria allowed us to remain agile with the questions we were asking and identify when we saw similar answers and themes from participants, indicating theoretical saturation.

During the first coding round, the first author open-coded the focus group transcripts, reading and coding each line-by-line [11]. In coding, the first author noted differences in how participants imagined handling their digital data based on how the relationship ended and how the type of data (*e.g.*, possessions and connections) impacted decision-making. As the first author coded, he wrote detailed theme memos describing the impact of various dissolution outcomes on participants' thinking [70].

After completing the initial round of coding and memoing, the authors met and discussed the emergent themes in the code system. Through discussion of how participants thought through handling their various data in different scenarios, the authors identified two major themes around data management and nascent axial codes in the data.

The first author then returned to the transcripts, conducting a second coding round. During the second coding round, they focused on identifying axial codes [18] that indicated important factors participants used in rationalizing their decisions across the various break-up scenarios and digital data. The first author wrote detailed axial code memos that helped further develop the axial themes present in the data. The second round of axial coding identified 4 important factors for participants when imagining how they might handle their digital data in the aftermath of different break-up scenarios. Next, we discuss those two themes and four factors in our Findings section.

4 FINDINGS

Our analysis of the focus groups and our participants' imagined reactions to different break-up scenarios highlighted two types of data representation that exist online after a break-up: past-facing and future-facing identity representations. We begin our findings by describing these representations and relating them to the curatorial philosophies that prior work identified [65]. Then, we introduce factors that our participants felt might impact their decisions around managing their data after a break-up, impacting their concern around accuracy and legitimacy and their subsequent curatorial philosophy and actions.

4.1 Managing Past Identity with the Future in Mind

When considering the possible ends of their relationships, our participants had many different kinds of data that would remain online and viewable by their audiences on social media. The longevity and persistence of that data beyond the end of a relationship were problematic for breaking up, moving on, and presenting an identity of "no longer being in a relationship." In other words, the representations that these data presented in the wake of a break-up would no longer be accurate to one's present self. Instead, they present a past-facing identity that would no longer be accurate moving forward.

The persistence of past-facing identities was a concern of our participants. For some, they imagined wanting to ensure that it was clear they were no longer in a relationship. Consequently, they wanted to remove data representative of their past identity — in this case, that they were once in a relationship. For example, Matilde discussed how she would remove posts from Instagram as an implicit signal to her audience that her relationship had ended:

> I think for me, it's about presenting that I'm no longer with this person maybe for like future people who are looking at my page, like if somebody sees my pages wondering if I'm single or not. I don't know. Just a determination publicly that the relationship's over without posting like, "Oh. This relationship ended." It's kind of a symbol of that without being something so obvious. (Matilde)

Because Instagram lacks explicit features to denote relationship status (*e.g.*, Facebook's "In a Relationship" feature), participants were left attempting to forecast how their audience might

interpret cues from their profiles and how they would make decisions accordingly. When asked what type of posts she would delete, Matilde said:

> I feel like anything that's more couple-y or more, I don't know, just like more relationship-y, I would probably delete, delete. But just like more normal pictures, I don't think I would, but I'm also somebody who hoards pictures. (Matilde)

When asked what she meant by 'couple-y,' Matilde explained that she would delete posts that portrayed her relationship with her ex. A post from a date or a post expressing appreciation would be couple-y and so deleted; a picture from a hike or images that had more than just her ex in it would not.

Matilde exemplifies what our participants told us about when handling data from past relationships. Deleting posts would signal that her relationship was over to audience members who knew about the relationship while ensuring that new audience members would not think she was still in a relationship. Tom followed a similar line of thinking but with a slight (but significant) difference:

> I think I would keep maybe one post [of my ex] and delete the rest, but then make it known through stories that I'm single. (Tom)

In contrast to Matilde, who would delete anything she deemed 'couple-y,' Tom imagined that he would likely keep a picture from his and Corrine's first date while deleting the other posts and photos from the relationship. When asked why he would keep that post, Tom gave two reasons: 1) he liked it, which represented a good memory, and 2) it was far enough down his profile that he didn't think anyone would confuse it with his present identity.

The concerns around past-facing identity that participants shared with us were actually concerns about how audiences would interpret one's identity moving forward — how their identity would be interpreted in the future. Consequently, deletion was their way of ensuring their identity would not be misinterpreted, and their audience would not believe they were still in a relationship. Such a misinterpretation could prove detrimental to one's ability to move on and date someone new or could just come off as weird, as Ellie described through a scenario involving her sister and the pictures her new boyfriend still had from a prior relationship:

> He [the new boyfriend] kept the photos [on social media], and then my sister and him started dating, and I was like, "Jordan, what's up with these photos? This is kind of weird." He posted a photo of [Ellie's sister] and then there were still photos of his ex-girlfriend. (Ellie)

Having data remain on one's profile might send conflicting signals about the status of the relationship and one's commitment to a new relationship — the weirdness that Ellie describes upon seeing her sister's new boyfriend on social media. The concern around conflicting signals, weirdness, and, more broadly, around presenting an identity that would be correctly interpreted as being of the present was the concern of a revisionist curator in the wake of a break-up. While one's close friends and perhaps family are likely to know about a break-up (almost synchronously, in some cases), our social networks on SMSs are much larger, filled with weak ties and even unknown connections, like Ellie's new connection to her sister's new boyfriend. Thus, when considering how their identities would look moving forward from the break-up, our participants would have to consider many different audiences, each with varying levels of information that could impact how they interpret our participants' identity exhibitions.

A revisionist from Pinter and Brubaker is "curating an identity presentation that is present- or future-facing." The data management practices that a revisionist undertakes are spurred by a desire to create a current identity exhibition online — in the case of break-ups, an identity exhibition of being single. The misinterpretation of one's identity exhibition could occur when someone stumbles

upon an old post of the relationship via the 'Explore' feature. New potential partners might add and then browse their profile, or how one's current audience might interpret the persistence of photos from the relationship.

In the case of participants like Matilde and Tom, imagining how they might react if their relationship ends, we see them imagining that they would act as revisionists. They imagined being concerned with how their data might be interpreted as being accurate to their identity at the time of viewing — that the picture of them with their exes posted a year ago would be evaluated as accurate and current because it was still on their profile. To mitigate the chance of this happening, they imagined managing data to remove it from their profiles, lessening the opportunity for misinterpretation to occur.

4.2 Curating Exhibitions for Oneself

While some participants paid attention to how their online exhibitions might conflate past and present, other participants were primarily concerned with the validity of data from the past. In considering how they would manage their data if their relationships ended, participants paid close attention to how that data might inaccurately represent the past. They focused less on how others might perceive their data and more on what they felt was an authentic representation of themselves. These concerns were prominent when content inaccurately represented the past (and its relationships) — for example, when infidelity had ended the relationship.

Take, for example, a photo of two romantically involved people posted online. This photo is a valid representation of reality at the time of creation. Conversely, a picture of a couple who were together at the time of creation but where one of them was currently cheating on the other would be a flawed representation because it presents a reality that is not truthful.

One participant (Bernie) used the term legitimacy to describe this concern. Other participants in his focus group subsequently used or alluded to the term, and participants in future focus groups contended with similar concerns as Bernie. Bernie and other participants used legitimacy to describe their concern that the representation created by data was flawed in some way at the time of creation. Bernie talked through his conception of legitimacy as it related to infidelity being a potential cause of a break-up:

> If infidelity isn't a factor, then it feels like all of those posts were legitimate, but when infidelity is a component, at least my take on it is that some of the content you might have shared, maybe that wasn't legitimate. And so it kind of feels like a lie. And so to prevent yourself from having to look through that again and also feel like you've been made a fool in front of all of your connections online, that's sort of the first reason that comes to mind or the first justification for wanting to remove content in a breakup caused by infidelity. (Bernie)

Bernie reasoned that in the case of a break-up caused by cheating, data captured after the affair had started but before the break-up happened would be illegitimate. It represented a false experience. Alternatively, in the case of a mutual break-up, Bernie rationalized that the data correctly represented his experience as it was:

> Basically, feeling like the content that I put out there into the digital space was legitimate content or not. If we'd agreed to end our relationship, on mutual terms, then at least what I would assume is that everything I felt in the moment when I posted that content, and everything you [speaking to his partner] felt in the moment you posted your content was how we really felt. (Bernie)

In contrast to his feeling about a break-up caused by infidelity — that the data representation might be flawed in some way — Bernie reasoned that in the case of a mutual end, there would

be no questions about the validity of the data representation. In both scenarios, Bernie's concern about the legitimacy of the data and its representation of his identity online led him to a data management strategy: to remove data that was illegitimate in some way. Leon, who was in the same focus group as Bernie, resonated with this legitimacy:

> I'm pretty much on the same line of, like, it was all authentic and it was really what we did feel. So, I wouldn't see any reason for it to be removed, because it was all true. (Leon)

Similar to Bernie, Leon thought that in the case of a mutual break-up, there would be no reason to believe that data from the relationship created a false representation of the relationship or how he or his partner felt at the time the data was created (*e.g.*, picture taken). Accordingly, he would not remove it after the break-up because the data created a legitimate representation of the past.

Across the various break-up scenarios, our participants' concerns about legitimacy were largely internal. The legitimacy of data was not related to what participants thought their online audience(s) might interpret the data to mean or represent. Instead, legitimacy centered on their understanding of the relationship, their experiences, and whether the data correctly represents how they interpreted the relationship happening and ending. For example, Bernie's concern about the legitimacy of data in a cheating situation was translated into consideration about memory: he did not want to see something that contradicted how he understood his experiences when data was initially created.

More concretely, Bernie would not want to see a photo or post that showed his relationship in a positive light if he knew that his partner had been committing infidelity at the time because it misrepresents how he might feel about the relationship.

Because legitimacy is only a concern with data that persists online, it was not a concern that revisionists who delete content after a break-up had to contend with. As discussed previously, revisionists, being concerned with the accuracy of data at the time of viewing, would remove data that represented the relationship because they were no longer in a relationship. Instead, legitimacy was of concern to archivists, individuals who decided to keep data online after their relationship ended.

4.3 Factors That Impact Curatorial Philosophies

Participants identified the two types of identities they were interested in presenting on their social media after a break-up — past-facing and future-facing identities. We see past-facing identities being a concern of archivists, while revisionists curate future-facing identities. We now focus on the various factors that might complicate individuals' data management decisions after a relationship ends. We have grouped the factors our participants discussed into four categories: following the ex's lead, the emotional reaction to a break-up, honoring the past and respecting the future, and the function of social media sites. We discuss each of these factors next.

4.3.1 Following an Ex's Lead to Provide Care. In situations where the break-up was precipitated by one half of the couple (*e.g.*, one broke up with the other, or one cheated on the other), participants felt a responsibility towards their (former) partners to soften the impacts of the break-up by altering their data management practices. The sense of responsibility that participants anticipated feeling resulted from the type of emotions associated with the break-up — principally, guilt. In the inverse scenario, in cases where they were being broken up with, participants anticipated blaming their ex, relying on the idea that the ex would feel guilty.

Regardless of which position they imagined themselves in (wronged vs. wronger), participants thought that the wronged person should be the one to make decisions about data management post-break-up first. Colloquially, this was referred to by participants as "following their ex's lead."

For example, Tom discussed the scenario where he broke up with Corinne: *"What I would do if I was breaking up with her, I would not do anything. Honestly, I would probably respect whatever she wanted. So if she kept all of our posts together then I would do that for some time. And just be super respectful, I think... She would probably be really upset, and I wouldn't want to make her any more upset, especially if I wanted to move on. But if that were happening to me, I would probably go off social media for a while and just take a break and focus on myself. And then check back in, and if her posts are deleted then delete mine too."*

Sherman agreed but reasoned that the way the relationship ended might impact how much he did or did not care about (or respect) Cat, saying, *"I think, just in my head, I feel like we respect each other so much that we would just kind of go off of what the other person wanted. Again, if it was a cheating scenario, it would definitely be more instant, but with a break up it would just be archiving things probably."*

Bundled in our participants' reasoning for what they would do after a break-up was a sense of care — following the wronged party's lead was an act of care towards the ex, and not "breaking up again" by deleting data before them. Our participants' experiences illustrate that there are functionally two break-ups — the one that occurs offline and the second one that occurs when data is managed online to formulate post-break-up identities. For example, Elsa imagined starting to see someone new but not wanting to hurt Leon, so she would hide new posts from him via filtering or blocking features (depending on the platform): *"I wouldn't want you to see it either. I guess I would hide you from seeing it..."*

Considering posting or what an ex-partner posted after a break-up was common amongst our participants. In cases where they were the ones who did the breaking up (or cheating), care was taken, and so "following their lead" took place. However, considering posting in the wake of being cheated on or broken up was also discussed by our participants. Take, for instance, Corinne, who talked through what she would do if Tom cheated on her:

> I think I would be really angry. And I think that I would feel really unsure, and probably really insecure for some time, and very sensitive. So I'd probably remove him from my social. As in post-wise, I don't know about following-wise. Like I said before, I would want to know what he's up to that was so much better than being with me, kind of thing. You know what I mean? Like, what is he doing now? What... Who? Right? I would want to have answers to those questions if he wouldn't give them to me. Granted, even if he gave me those answers, I probably wouldn't trust them. So I'd probably... Because like he said, he'd probably try to protect my feelings and respect me. And so I would want to know what's going on. So I'd probably keep him on. I don't think that I would do anything necessarily with our mutual friends or connections or his friends or mine or anything like that. (Corinne)

While Corinne would delete datafied representations of their relationship (*i.e.*, pictures or posts), she would not remove the connection to her now-ex or mutual connections. She reasoned that she would want to know what he was doing "that was so much better than being with me." In line with what other research has found [28, 56, 59, 77], she would leverage those connections to stalk him on social media.

Yet, Tom said that in this situation (he breaks up/cheats on Corinne), he would follow her lead regarding data management, and not remove her as a connection. The decisions these two articulate illustrate a subtle but significant tension. If Tom attempts to provide care to Corinne by not managing his data, but Corinne does not manage her data either as a means to be able to stalk Tom, then both would retain data they might otherwise delete. As a result, they are both more likely to be exposed to recommendations based on the retained data from their relationship data

that could prove harmful — providing information about what the other person is doing that might impede healing and moving on.

Closely related to the sense of care and desire to follow an ex's lead when it came to post-break-up data management was the emotional reaction our participants imagined having in the wake of a break-up. We discuss that factor and its impact on curatorial behaviors next.

4.3.2 The Emotional Reaction to a Break-up. Even in the best situations, break-ups can be emotionally fraught experiences for both involved. Our participants described numerous emotions they might feel during and after a break-up with their significant others and how those emotions could impact their data management decisions. Bound up in these emotions was the type of break-up being discussed and how that might spur action immediately in some cases (*e.g.*, infidelity) or not at all (*e.g.*, mutual ends).

Emotions ran the gamut from sadness to anger to acceptance. These emotions and the subsequent reactions that participants had *vis a vis* their data often varied by the type of break-up experienced. For example, when asked about the scenario in which they were cheated on by their partner, Corinne and Henning both had very visceral reactions:

> All their shit's gone. (Henning)
>
> Burn it. (Corinne)

The desire to immediately delete data that represented the relationship was a relatable position for our participants, particularly in cases of infidelity. While emotions our participants shared in this scenario were very similar — a very visceral, reactive emotion, in some cases close to anger — the resulting actions they would take were not. Take, for instance, Ramesh and Puja. Puja reasoned that she would delete data, similar to Henning and Corinne:

> I'd see how that would be pissing me off. Yeah. Cheating at least is like by default, I am gone. (Puja)

But Ramesh, her partner, had a different approach, focusing on removing himself from possible exposure rather than on removing data:

> Just to be sure [that I would not see anything], I would delete my socials. I would just go off the grid. (Ramesh)

Ramesh's response to being cheated on would be to disappear, at least initially. He shared that this would be his reaction in most break-up situations – to disappear either by "getting off" of social media (*i.e.*, taking a break) or by deleting his social media and starting anew with new accounts. He went so far as to ghost entire friend groups in previous situations where he felt betrayed, as it related to relationships.

Even in a situation where he cheated, Ramesh would still go "off the grid." However, he'd take more data management action faster than in other scenarios:

> I would probably delete it [social media], because it would remind me of the bad things that I did. So, obviously, I was the one who cheated on her, but, at the same time, I would also go off the grid, because I did something bad at the end of the day. (Ramesh)

Other scenarios prompted different kinds of reactions. For instance, Cat and Matilde, who were in the same focus group, talked through the scenario of a relationship that did not end because of infidelity and how that would impact their data management decisions:

> It's one of those things where those good parts just overpower how it ended, so it's a little too hard to just let it go, because not only did I lose a partner, but I lost my best friend. It was kind of like those things where if it's not just explicitly us two standing

> together, but it's from a good memory, I probably still have it just because I like those memories, but I don't want to be reminded of us together. (Cat)

For Cat, they would delete data representative of the relationship (echoing Matilde from earlier) — things that depicted them and their partner. However, Cat would keep data representing a good memory, reasoning that the positives associated with that memory would overrule any sadness or anger about the break-up. Consequently, in a situation where our participants might generally act as revisionists, Cat and Matilde would instead act as revisionists, keeping specific data that might help them remember the relationship positively. In describing how they would keep specific data even in the worst kind of break-ups, both Cat and Matilde used the word "bittersweet" to rationalize their imagined decision-making:

> I would probably leave that [a photo on social media], personally. Just because I think with cheating, all the emotions will be negative, versus in some of those other scenarios, it might be more bittersweet, or you might be able to just appreciate that memory [that the photo spurs] more. (Matilde)

> I think it would be bittersweet, just because, like we said, we have respect and things. It would be bitter, because obviously you're like, "Well, we're not together anymore. It kind of hurts," but it would be sweet in the fact of like, "You're out there. You're doing things. You're being posted about." It would be like a good reminder like, "Okay. Even if you're not great, you're still alive, and you're still doing somewhat well, like enough where you're out doing things and doing that." I think it would be one of those things where you'd see it. Yeah, you'd have a moment of hurt, but I think it would be also sweet in the fact of like, "Okay. At least I know that you're still active in life without me," because I think we're just so tied to each other that any sort of breakup would be very hard. (Cat)

Here, we see connections to work by Lustig & Brubaker on "bittersweet content" [55]. Their study of difficult encounters with algorithmically curated content found that categorizing content as either positive or negative can miss the nuanced relationships people have with the past. Even painful memories, they found, can be precious.

Even in the scenario of a mutual break-up, our participants imagined that there would be sadness involved. But in the case of infidelity, the intense anger of finding out about the betrayal had our participants preferring faster data management than in other break-up scenarios.

Yet, when data was maintained after a break-up, it could also serve as an emotional reminder, as evidenced by Cat and Matilde. Some data represent experiences and memories that are so good that our participants would not delete them, no matter the situation surrounding the end of a relationship. In situations where one might act as a revisionist, the emotional attachment to a particular memory — represented by data — could encourage one to act as an archivist towards that specific data.

4.3.3 Honoring the Past, Respecting the Future. A different factor that might impact decisions around data management was the possibility of moving on — of starting to date someone new and having to balance having old data indicative of a past relationship on one's social media while simultaneously posting new data. Here, if they started seeing someone new, participants said they would get rid of the photos/posts left from the relationship to respect the new relationship, regardless of what their ex had or had not done.

For example, Braden talked through the scenario of growing apart (mutual ends), reasoning he wouldn't do anything with the possessions: *"I'd probably keep the stuff, or archive it, or keep it. It*

would still be good memories from the past. The only way I would maybe delete the stuff is if the next person was like, "You need to delete all this stuff."

Like many of our participants, Tom agreed with that sentiment: *"I think my first thought is respecting my new relationship and doing what they want. If there's something we can agree upon."* Here, Tom is imagining balancing his desire to keep the single 'couple-y' photo mentioned earlier with an imagined new partner who finds it weird that he would keep it on his social media.

The notable exception here was Corinne, who imagined that she would want to retain things to show her children in the future the way her mom had with her:

> And I think that if Tom is the person that I marry and we have kids, I would want to be able to show our kids, yeah, this was the crap guy that I dated before I met Tom. Look at how horribly ugly he is, and look at what have now, kind of thing. And explain to them what I went through, and tell them about the stories and show them things... The mementos that I still do have. I think from my old relationship — I have a couple pictures of him. (Corinne)

While Corinne differed from other participants in wanting to retain data from a relationship, she was still considering the future — just a different future than other participants. Specifically, she imagined a future where she might want data from a past relationship and might want to share it with others. Here, we see Corinne imagining wanting to act as a revisionist in the short term, to create identities that would be inoffensive to new partners, but in the longer-term act as a revisionist; a curatorial approach currently not well-supported in social media sites.

When thinking about the potential end of their relationship, most of our participants discussed the competing desires to honor the past but respect the future. Particularly in cases of mutual ends, these competing desires left participants imagining they might not do any data management initially (acting as an archivist) but that they might remove content about previous a previous relationship (revisionist) as part of dating someone new.

4.3.4 The Function of Social Media Sites. Finally, participants considered how they used their social media sites, what those accounts and that data meant to them, and who was in their audience on those sites. For many participants, Instagram presented a current identity:

> I [wouldn't] go through my Facebook photos as much, [because] I don't think other people go through my Facebook photos a ton. So I don't know if I would take the time to delete everything. I think [I would focus] more on Instagram, because I think the feed is more of who you are. (Ellie)

Ellie imagined her audience on Facebook would not bother to look at her photos, meaning it wasn't worth the time and effort to manage them. However, she was concerned about the accuracy of her Instagram profile, so she would manage the data more carefully. As a result, she adopted a revisionist approach to Instagram but an archivist approach to Facebook.

Our participants discussed similar differences in how they would approach individual platforms, but the specific platforms varied. For instance, Matilde strongly preferred to preserve the content as a "time capsule of your life." However, she felt this time capsule was best represented on Instagram.

Danny summarized the impact of different platform purposes on data management decisions well: *"And I also think you should think about the different functions of social media. Instagram, like you two were saying, is kind of like a, 'This is me, and this is what I'm currently doing within the last year or so. Here's who I'm dating, here's this, here's that.' And then I think Snapchat is like, 'What am I doing right now?' And maybe Facebook is the network of people that I'm connected to."*

Different platforms had specific uses and audiences, subsequently impacting our participants' data management practices after a break-up. On Instagram, Danny would manage data more

aggressively because he saw Instagram as current. Conversely, on Facebook, Danny might not manage as much of his data because he views Facebook as less about who he is and more about who he is connected with. Making decisions about managing data is understandably bound up with platform affordances and audiences. Accordingly, one might curate different post-break-up exhibitions on different platforms depending on one's perceived social use of that site.

Next, we transition to discussing how individuals make decisions about past- and present-facing identity and how the four factors we presented here impact that decision-making process. We do so by introducing a framework that accounts for two curatorial philosophies about each other and identifies where the factors might impact decisions to act in one way or the other.

5 DISCUSSION

In this section, we introduce the break-up identity decision framework, a conceptual model based on the decision-making process our participants imagined going through if their relationships ended. Our framework enables clear insights into how the context surrounding a break-up can impact the decision-making that one might take when managing their data after experiencing that break-up. Using this framework, we outline implications for designs that can support that decision-making. We tie our implications here back to the experiences and forecasted actions our participants shared. Finally, we conclude our discussion by acknowledging the limitations of the work presented here and opportunities for future research.

5.1 Implications for Research

In imagining what they would do if their relationships ended, our participants considered when they would be a revisionist or archivist concerning their data and subsequent post-break-up identity. Their reasoning through the various break-up scenarios we presented them illustrated a decision-making process around how to make sense of the break-up and, subsequently, how to manage the leftover data. In Figure 1, we present a decision-making framework for data management following a break-up. Our framework draws on Haimson's [32] adaptation of van Gennep's [78] liminality, positioning the decision-making around data in the wake of a break-up as a process of reconstituting an identity. That process might be complicated by factors related to how or why the relationship ended, but also by the very nature of social media as public squares [10].

To demonstrate and discuss each part of the framework, we present a hypothetical break-up between two imagined people: John and Sarah. While this is presented as a hypothetical situation, it is informed by the experiences and thoughts our participants relayed to us about what they had done in prior relationships and what they thought about doing if their current relationships ended. John and Sarah's break-up was initially relatively straightforward and pain-free — it would fall into the category of mutual ends that we presented to our participants.

After the break-up, John and Sarah had data remnants of the relationship on their various social media platforms. After their break-up, they had to decide what to do with their data. For John, he considered a picture on Instagram of him and Sarah at a close friend's wedding. For Sarah, she considered a post on Facebook that John had left on their anniversary. They both decided to do something with the data, bringing us to the first decision point in the framework — evaluating if the data is accurate to their current identity.

John's picture and Sarah's post are both inaccurate. They both represent a relationship that has now ended. Deciding that the data is no longer accurate thrusts John and Sarah into the next decision point of the framework: Are they more of a revisionist or archivist? For Sarah, the post that John left on their anniversary was nice at the time, and while she is not ashamed of her relationship with John, it seems weird to her to leave it up on social media. After all, what would someone new she dates think of it, and consequently of her? Sarah is a revisionist and deletes the post shortly

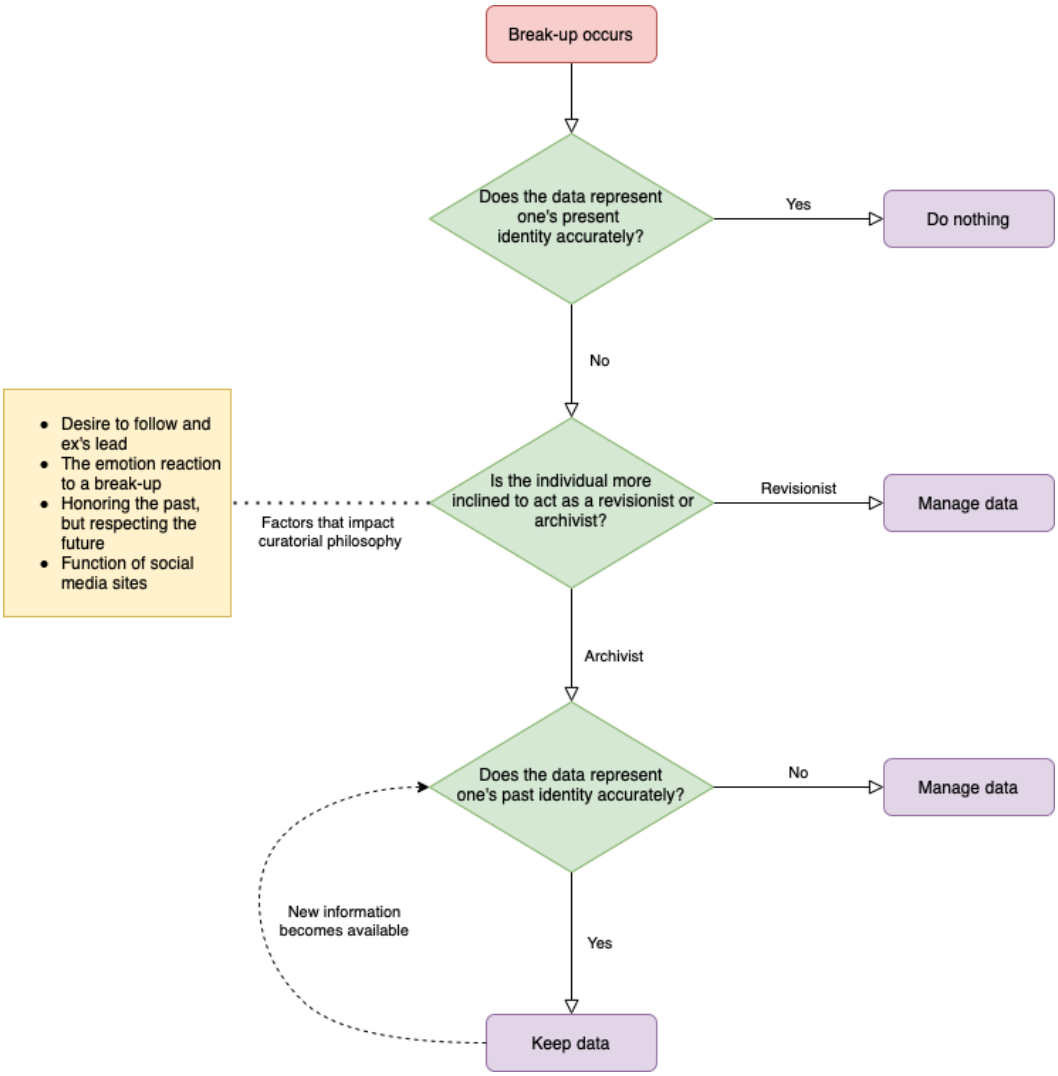

Fig. 1. The Break-up Identity Decision Framework

after the break-up to ensure that social media presents an accurate present identity. Sarah also contended with the possible 'tainted' association the post held to John [37–39]. However, in this situation, she was not ashamed of the post or of having dated John; her decision-making is related to the type of identity she wants to present online after experiencing the break-up with John. Her decision to manage data related to John or the relationship comes not from wanting to rid herself of 'tainted' data that might spur upsetting experiences [66], but rather from a desire to reconstitute her digital identity as that of being single [65].

John, on the other hand, is an archivist. The photo of him and Sarah is meaningful for many reasons, and he is generally happy to have dated Sarah. Accordingly, he decides to keep the post. Moreover, John recalls being truly in love with Sarah. He remembers feeling her reciprocate that

love at the time, meaning the representation of their relationship at the time of the photo matched his experienced or understood reality. Consequently, he decides to keep the photo up.

The hypothetical situation presented here focuses on two people's experiences, each on a single platform (*i.e.*, Facebook for Sarah, Instagram for John). However, our digital identities are more complex and exist across multiple platforms [80]. Haimson's [32] *social transition machinery* accounts for this, arguing that different platforms can present different identities simultaneously during life transitions. Yet, when a life transition involves severing ties to others (whether digital or otherwise), social transition machinery fails to account for the public nature of data management. For example, Sarah's decision to remove the post that John had left from her profile represents a moment of identity reconstruction on that particular platform; the management is constrained to that platform, so data representative of the relationship may still exist on other social media sites. Yet, that data management decision is immediately observable by her Friends on Facebook, which might include John or people who might tell John about Sarah's removal of the post. The ways that relationships cause social networks to overlap online and offline create issues when attempting to manage data as part of reconstituting identity.

Of course, there is always the chance that new information might become available that would change John's experience and cause it to mismatch with what the photo portrays. For example, imagine that in the month after his and Sarah's break-up, John finds out through a mutual friend that Sarah had been seeing someone else at that time — cheating on John. Here, John might decide the identity presented in the photo (*i.e.*, being truly in love, and *feeling that reciprocated*) may no longer be accurate to his understood experiences. Bearing this new insight, John might revisit the photo and delete it. John is still an archivist, but he wants the data from his past to be accurate to how he experienced and understands that past.

On the other hand, Sarah would not need to change her data if John learned that she had cheated on him. While the revelation of her infidelity might very well have offline ramifications, as a revisionist, she already removed her data before her affair came to light.

To this point, we have discussed the framework through an initially neutral break-up where the two individuals amicably part. However, relationships can end for various reasons and subsequently impact decisions around data management (*i.e.*, acting as a revisionist or archivist). Imagine that instead of an amicable break-up, John ended the relationship because he learned of Sarah's infidelity. In the previous scenario, John acted as an archivist. However, in this situation, he is angry enough at Sarah that he acts as a revisionist instead of deleting all the data from the relationship. As discussed in our Findings, the emotional component of why and how the break-up ended caused him to change his curatorial philosophy.

Illustrating the impact of other factors previously identified in the Findings, Sarah (who was a revisionist in a more amicable ending) feels a sense of guilt over her infidelity. That guilt spurs her to wait for John to decide what to do with the data on his profile before doing anything with hers. Sarah's guilt has led her to change her curatorial philosophy to that of an archivist due to a sense of obligation to John — she wronged him, and taking action on her data before he does on his might wrong him again. Of course, if Sarah and John were never connected on a particular platform (*e.g.*, never Friended each other on Facebook), then Sarah might manage that data because John would have less chance to notice. Alternatively, Sarah might view a particular platform as more for family and want to avoid any uncomfortable questions about deleting John's data on that specific platform.

Each of the factors identified previously can impact the curatorial philosophy that one might hew to in deciding what to do with data in the wake of a break-up. Additionally, the concepts of legitimacy and accuracy play an important role in one's decision-making and decision-taking processes, as we previously discussed. Consequently, these concepts — bound up into the framework

introduced here — offer design possibilities to improve individuals' experiences with data decision-making and management after a break-up. In the next section, we discuss those design concepts and use them to speculate on potential designs that designers could take up in redesigning the features and algorithms that people interact with within social media systems.

5.2 Implications for Design

Our framework ends with the decision to take an action — either keeping or deleting data. These data management decisions are operationalized in social media systems as features. Based on our participants' experiences, these features' use (or non-use) impacts the identities presented online through the available data for algorithms to use and people to see. For instance, our participants imagined leaving data on their profiles after a break-up could be misinterpreted as still being a relationship.

However, the features that presently exist across many social media sites are designed in ways that do not support well-being when utilizing them — they expose people to potentially upsetting information when attempting to manage data or leave people in positions where they might receive upsetting algorithmic suggestions [66].

In this section, we leverage our framework to identify design implications for designing features that support individuals' ability to manage their data after a break-up. We examined how existing functionality might support users' needs as they traverse the decision-making workflow introduced in the prior section. Analyzing each step in the workflow, and the corresponding type of identity management being done at that point, we offer six implications for design; three aimed at improving revisionists' experiences, and three aimed at improving archivists' experiences. To illustrate how designers might incorporate these principles into their systems and features, we offer concrete design suggestions along with each implication.

5.2.1 Designing For Revisionists. A revisionist wants to curate a current online identity. Features that support a revisionist approach to data and identity in the wake of a break-up are fairly straightforward — they are seeking to remove data to ensure their online identity is up to date and presents an identity that is of the present.

Accordingly, deletion is a revisionist's feature. It is absolute, resulting in the removal of data from one's profile. Deletion is an available feature across all social media platforms. It is highlighted explicitly on some as an available feature via differently colored or formatted text to encourage use (see, for example, Instagram's design). Deleting a post or other data corrects what the revisionist sees as an inaccurate identity presentation. In the wake of a break-up, one could delete a post or picture from a social media profile in as few as 3 taps; a similar number of taps could delete the connection that one has to another's profile via unfriending or unfollowing.

However, during our analysis, we identified three shortcomings that deletion, as currently implemented on most platforms, presented for our participants. This section details each, offering a design implication and possible solution. We aim our possible designs at improving user experiences in the wake of a break-up, but imagine that the implications we present here might apply to other types of life transitions.

Expanding beyond deletion. Deletion removes the data from the user's profile regardless of the specific data. Depending on the platform, the deleted data might be held for the user to review for some time before being permanently deleted (*e.g.*, Facebook holds deleted data for some time and allows users to restore that data). In the case of connections, the severing of the connection is immediate and final, with the only remedy being to re-friend or re-follow the person — a problem in its own right, given the notifications such behavior can generate.

However, deletion offers users few options regarding what to delete or how to delete it. For example, Instagram users can delete any post (and all its attached images). But there are somewhat arbitrary rules for multi-image posts: When a post has three or more images, users can remove images from the post, provided there are always at least two images left. Photos in 2-image posts cannot be deleted, and in no cases can the user replace or edit images (1-image posts or any slideshow). Even extant tools that support specific types of deletion (*e.g.*, deleting specific comments, or deleting specific photos from a longer slideshow) are hidden behind several menus and hard-to-find buttons.

The absolute nature of deletion leads to the first design principle: features should **give users more options when managing their data**. In the specific case of break-ups, and the larger case of life transitions, deletion might not need to be the revisionist's choice of feature. Other types of management, like more robust forms of editing or revision, might support a revisionist's goals better. Imagine, for instance, that John particularly liked how he looked in that photo of him and Sarah. A tool that allowed him to edit the photo, to crop Sarah out of it, could enable him to keep the photo up after finding out about her infidelity. Instead of deleting the photo and the good things that might be explicitly (*e.g.*, comments, likes) or implicitly (*e.g.*, memories associated with the time that photo was taken) tied to it, editing might allow a user to keep more of their data after a break-up, and allow for more appropriate forms of reminiscence that will prompt good memories instead of upsetting ones.

Similarly, the ability to add or remove photos from slideshows on Instagram could allow one to swap photos out of a slideshow post in the wake of a break-up. Matilde mentioned this as part of her focus group: She had a slideshow of photos from high school prom on Instagram, with one of the photos including her boyfriend at the time. She wants to delete that photo but keep the other picture up as part of the post but cannot, as the platform is currently designed.

Reducing exposure when removing possessions and connections. Deleting can inadvertently expose people to information they might be better off without. As prior work has shown, distance from one's ex and controlling what kind of information one encounters has been linked to healing (*e.g.*, [51]). However, our participants highlighted the possibility that a person going to delete their connection to an ex from Instagram to get this distance might have a bad experience because of the platform's design. The only ways to delete connections on Instagram are by unfollowing them via that connection's profile (exposing one to their 9 most recent photos) or by using the item menu in one's feed after seeing a post from that connection (a post that might be jarring or upsetting, especially after a break-up).

In either case, the user must see a post or profile, potentially exposing them to new, upsetting information about their ex before accomplishing any data management action. Seeing what an ex has been up to reduces the distance and could impede healing and moving on from the relationship. Moreover, it could encourage "stalking" behaviors, which are unhealthy in the aftermath of a relationship ending (*e.g.*, [28, 56, 59, 77]). To counter this, we suggest our second implication for design: features should **enable data management with minimal information exposure**.

In exploring potential ways to address this challenge, we took inspiration from scenarios where social media platforms initially blur or hide potentially offensive content. A similar principle could be helpful here. By hiding connection data, a user could manage their connection to others without being exposed to more detailed information about what that connection has been doing. For example, when deleting connections on Instagram, it is unlikely that requiring the user to view an ex's profile, including all of their photos, is necessary. An interface that shows the connection's thumbnail, username, and profile name would often suffice.

With this in mind, a straightforward solution that puts this design implication into action would be allowing users to conduct management action on connected profiles on the Search screen without seeing their most recent 9 posts. Returning to John and Sarah, obfuscation would help John manage his connection to Sarah, ensuring he does not have to see recent posts she has made (which could include the individual she cheated on him with). Our participants noted that in the case of infidelity, many of them would immediately disconnect and delete their ex from their social media ("All their shit's gone," in the words of Henning); yet in the case of finding out later that the break-up was because of infidelity, that data management might be fraught with the chance of seeing posts that are better left unseen. Obfuscation could solve this and improve user experience when managing their connections.

The problems that obfuscation would best address are readily seen with managing connections but are also present when managing possessions. Currently, many social media sites do not support the bulk management of possessions on one's profile. Instead, to act upon possessions, one must go to each post or photo individually. A potential redesign considering obfuscation might enable users to manage possessions in bulk without viewing individual posts or associated artifacts. Letting a user manage data this way may also prevent the memories associated with that post from resurfacing. As with connections, the thumbnails could suffice to help the user ensure that they are managing the right posts.

Ensuring what needs to be deleted is deleted. Deletion, while absolute, ultimately occurs at the level of individual pieces of content and individual connections. As a result, users are often uncertain that they have deleted everything of relevance. The problem of leaving data behind is one that prior work has identified — being sure that one has deleted all of the pictures of an ex, only to be surprised by a memory that includes the ex, is unexpected and upsetting [66]. Comprehensive deletion is also a problem for life transitions more broadly. For example, Haimson et al. [31] found that transgender individuals contended with issues around prior identity in the aftermath of their transition.

There can be data from many years ago in the specific case of a break-up, particularly after the end of a long relationship. Currently, many social media sites are organized by time — more recent data is presented at the top of a profile, while older data sinks further down. Scrolling down one's profile feed may be the only way to access that older data currently, a process that is tedious and prone to mistakes. To help users curate post-break-up identities, features should **features should provide ways for users to evaluate what data should be managed.**

Imagining a concrete feature that puts this implication into practice, we turn to the basic goal of many social media sites — to foster connections. Extraordinary efforts have been made to develop features that help connect people and content (*e.g.*, recommended contacts). One could imagine that during a moment of transition, people would benefit from these same techniques — but in reverse. Instead of encouraging people to connect with others, [66]'s suggestion of providing recommendations for people with whom to disconnect could be beneficial. For example, one might imagine a feature encouraging users to manage other connections closely related to the profile they just muted, unadded, or blocked. Drawing from computational means of measuring connections, like tie strength [30] (*e.g.*, a drop-off in interaction), such a feature could encourage users to manage multiple accounts quickly.

Similarly, features that leverage data to recommend other content or encourage reminiscence — like Facebook's Memories feature — might be redesigned to help users manage data more efficiently. Instead of encouraging reminiscence for the sake of reminiscence, encourage reminiscence in the service of data management by building in more robust management tools as part of these features. For example, imagine a reminiscence feature that presents a memory to a user, but a memory that

it thinks the user might want to forget, or a feature that presents metadata to select from and then populates data based on a user's selection.

Social media sites likely already have the technical means to support this principle. Sites could leverage machine learning approaches to identify relevant data to help users ensure they do not miss something while deleting data from their profiles. Noticing what a user is deleting in a short period and providing suggestions for other things to delete could help assuage any concern that data has been missed. Drawing on efforts to improve user well-being in other parts of social media platforms, like Facebook's Take A Break feature, a feature here might gather all of the data connected to a specific person in one easy-to-manage place.

An approach predicated on recognition and prediction could be extended further to benefit users. Imagine a user who deletes some of their data but decides not to manage other data (or does not realize there is more data they might want to manage). Leveraging the same information used to make deletion suggestions, platforms could hide or obscure similar data, reducing upsetting encounters by allowing users to opt-in before seeing it (thus simultaneously satisfying the previous implication for design and this one). Such an approach would go hand-in-hand with removing that data from reminiscence and suggestion features, helping create more space for the person or surrounding social networks that are being deleted.

5.2.2 Designing for Archivists. Individuals acting as archivists are concerned with maintaining data that contributes to their past identities based on their experiences and understanding of those experiences. Consequently, they might retain much of the data that represents their past relationships on social media.

Archivists have two avenues for retaining that data on their social media. First, they might not do anything to the data, leaving it on their profiles and remaining connected to others. Alternatively, they might turn to their namesake feature and utilize archiving functions for their possessions. Likewise, they might use features like 'muting' to manage their connection to another without entirely removing the connection, akin to archiving possessions.

The outcomes of these two actions are very different. For the archivist who decides not to do anything with their data, the resulting identity presentation may confuse audiences, as our participants noted when discussing leaving photos up on their profiles (recall Ellie evaluating the presence of her sister's new boyfriend's ex-partner on his profile as being "weird"). Leaving data publicly available on a profile and connections intact exposes the archivist to algorithmic features and their unexpected suggestions and encouragements to reminiscence on events that might be upsetting [66].

Conversely, the archivist who uses archiving or muting functionality to minimize yet retain information about past relationships with features such as archiving on Instagram or "For You" on Snapchat is creating an archive that may be unorganized and ultimately forgotten; an outcome that contradicts the defining characteristic of an archive as being accessible and usable [2].

In this section, we detail three implications for design aimed at improving archival functionality and, consequently, the experiences of archivists.

Reducing exposure to undesirable algorithmic recommendations. Even when the archivist is not ashamed or upset about the break-up, the unexpected nature of the content presented via algorithmically driven features can be upsetting [55, 66].

As currently designed, many reminiscence features (*e.g.*, Facebook or Snapchat's features — both called Memories) offer reminiscence suggestions that draw from a user's public posts. Reminiscence on both platforms is based on the date — they recommend memories from "this day, n years ago." The actual content of the memories varies but is presented with little to no warning of what that

content will be. In order to avoid such an encounter, it is incumbent on the user to recall what they might have been doing on that particular day, if they can, before opening any memory prompt.

Features exist to limit exposure to memories of specific people or dates (*e.g.*, Take a Break[3]). However, such features can go unused, with prior work defining the archivist as one who, in part, "is not ashamed of their past" [65]. If one is not ashamed of their past, they might not find it necessary to limit their exposure to data representative of that past. From the present design of reminiscence features, we draw our fourth implication for design: features should **obscure content that could be upsetting until the user indicates otherwise**.

With reminiscence features, a concrete method of putting this implication into practice would be to provide more signposting about what memories might surface when a system delivers a reminiscence prompt. For instance, imagine a reminiscence system that not only leverages user-defined data (*e.g.*, tags or textual descriptions) but also meta-data associated with a particular post or picture (*e.g.*, date, geolocation, data gleaned from image analysis, etc.). Such data could be used to obscure potentially upsetting memories.

Alternatively, reminiscence could be redesigned to draw source data from specific places on the platform. Imagine a reminiscence feature that draws not from a user's public-facing profile but one that instead draws from a specific "reminiscence-okay" archive. Such an archive could be instantiated when creating an account. While initially empty, users could be encouraged to place copies of data from other places on the platform into that archive. Not only would such an approach limit possible upsetting (and seemingly random) suggestions [66] because it would require the user to decide what data a reminiscence feature could leverage in making recommendations, but it would also incorporate other design implications that we have or will discuss here.

Turning to connections, features that encourage connection (*e.g.*, Take A Break on Facebook) operate similarly to Memories and other reminiscence features — they are predicated on an opt-out approach. That is, they ask the user after showing them a suggestion to evaluate the quality of the recommendation. Of course, if the recommendation was an ex's new significant other, then not only might that be a bad recommendation, but it might have also caused emotional harm to the user.

Based on our analysis, we might suggest that an algorithm looking to encourage connections should focus less on specific people within a network and instead on topically relevant and interesting accounts.

If we were to re-imagine how to encourage connections, we might focus less on particular people within a network and instead suggest connections to accounts that are topically relevant and interesting. More concretely, instead of giving a user the suggestion to add a person they might know, suggest an account associated with an interest that the user holds.

At a higher level, connection encouragement features might be redesigned to be entirely opt-in — in other words, make it a feature that the user must seek out to use rather than something that appears as part of regular use of that platform. As part of that, the user could be prompted to identify accounts they do not want recommendations on, perhaps drastically reducing the number of upsetting or unexpected recommendations.

Archives that support the ways we organize our lives. The archivist who utilizes archival features faces a different set of challenges. The unorganized nature of our social media archives presents challenges in the wake of a life transition like a break-up.

As individuals move through the world, they might imagine they are presenting a singular, cohesive identity to others. Some social media sites, like Instagram and Snapchat, have maintained the semblance of a quasi-singular identity — Snapchat enables us to set stories that our entire

[3]https://www.facebook.com/help/1638212473101795

audience can see, and Instagram stories and posts are both public to an entire audience (and, depending on one's setting, to the entire platform).

However, both platforms have features that acknowledge that our singular, cohesive identity has nuance, depending on who we interact with. Instagram has introduced the 'Close Friends' feature to allow users to set who can see specific stories, and Snapchat allows for 1:1 or 1:few communication.

Regardless of how they are presented on social media, our identities are not singular nor cohesive [27]. Experiencing a life transition ruptures that notion, exposing that our lives are multi-faceted and subject to interpretation by others. For instance, a break-up shows us how our identities are separate — going through a break-up is unlikely to impact one's work or close friendships.

Attempting to present these facets as one identity requires managing data that represents us, particularly in the wake of a life transition when these facets are more legible. Yet, the tools for managing and retaining that data — features like archiving — often lack adequate organizational functionality or the means to organize. From this, we offer an implication for design: Features should **provide the organizational functionality to support the various facets of our lives.**

Break-ups illustrate how data that was once appropriate to have publicly viewable by one's entire online following can become less appropriate as time and relationships change. Depending on the type of break-up, data from a relationship might be inappropriate for the users themselves to view. However, when archiving data, no organizational features allow for the siloing of data. Providing such functionality — allowing organization based on any number of factors, including the people or experiences represented in the data — would vastly improve archivists' experiences in these platforms.

Many social media features already allow users to organize data on some level. Instagram's 'Saved' feature (which allows users to save posts to view later) provides functionality to create individually named folders called Collections. Snapchat organizes a user's saved Snaps by date, providing a rudimentary way to navigate that archive.

However, both platforms could go further to improve the user experience in the wake of a break-up and sensitive life transitions. On Instagram, the archive feature provides no sorting or organization features, only the ability to post archived posts to one's Story. With such utilities available in other features on the platform, providing the functionality to manage one's archive would dramatically improve user experience on two fronts — it would prevent a user from having to see content that might be better unseen. It would make it easier to mass delete data if the archivist decided to go back and remove the data permanently (both of which satisfy design implications we have discussed previously). A feature that enabled user organization would allow the user to create multiple archives organized around specific topics or, in the case of a break-up, perhaps around a specific person(s).

If or when the user found it necessary to return to their archive, they would be faced with a repository of directories, each labeled previously by the user in such a way as to be able to discern what that particular directory contains... all without peering in and seeing any specific data. As a result, more organizational tools could prevent the user from being blindsided by memories they may not want to be reminded of at that particular moment.

Providing tools when they are needed most. The second issue we identified through our analysis when archival features are used is that archives are prone to be forgotten. Some participants told us they did not know that archival features existed. Others imagined they might use the archive, reasoning that they could "hold" specific data there and restore it later, but then admitted that they had never done that and had never heard of anyone doing that restoring work from a social media archive.

Indeed, many archival features on social media sites are easy to add to but more difficult to access and engage with, requiring one to navigate multiple menus. No algorithms leverage archived data, and no notifications occur to remind the user of the archive's existence. When asked about the archive feature, many of our participants noted they did not know about it. When participants did know about it, they rarely used it. Instead, they imagined it might be a useful feature to remove data from their profile temporarily and then restore it later. However, when asked if they had ever done this using existing archival features, none said they had; in fact, none had even heard of someone using the archive in that fashion.

Yet, a more traditional archive is expected to be used. Traditional archives possess characteristics of authenticity, reliability, integrity, and usability, and traditional archivists work to assess, collect, organize, preserve, and provide access to archives [1, 2]. Part of the job of an archive and an archivist is to provide access to archives, encourage people to use them, and make sure that archives are usable. Our participants' experiences illustrate a shortcoming of social media archives — they are not as usable as one might expect compared to other archives.

As our participants' experiences illustrate, archival features in social media sites are underdeveloped and underutilized. They do not encourage reminiscence the way a traditional archive might. As our participants note, they are hard to find and rarely used. However, in the context of break-ups and other sensitive life transitions, the archive has the potential to be a powerful tool for identity management. Here, we offer our sixth and final implication for design: Features should **identify when users might find them useful and make themselves more readily available in those moments**.

Prior work has illustrated that it is possible to predict when one has had a break-up computationally — factors like a decrease in interaction between two people are good markers for a change in relationship [75]. One could imagine a feature that leverages interaction data to suggest to a user that they might consider archiving or otherwise managing data.

Alternatively, a system could notice when a user is deleting an above-average amount of data in a short time and suggest archiving data instead. Recalling the very emotional and reactive nature of some break-ups (*e.g.*, break-ups involving infidelity), an individual might be upset in the wake of a break-up conversation and delete data that they may later want to keep.

A feature that measures the amount of data management occurring and then suggests alternate actions could encourage users to archive data in a specific repository (drawing on other design implications discussed previously). Then, the feature could ask the user if and when they want to be reminded of that archive's existence and give them a prompt to return to the archive and assess whether the data is worth keeping.

5.3 Limitations & Future Directions

Of course, our framework and the resulting design suggestions are not without limitations. The participants in this work were overwhelmingly white, cis-gendered, and heterosexual. The break-up scenarios that participants discussed were broad in nature; while many break-ups might fit into the three general types of break-ups discussed here, there are other types of break-ups. For instance, the considerations that one might have when managing one's identity in the wake of a divorce could lead to different decision-making than our participants in this study. Future research might identify other types of break-ups and resulting considerations that impact decision-making around identity in the wake of a break-up and further develop the framework presented here.

Additionally, the hypothetical break-ups presented in Section 5 to demonstrate the potential utility of the framework are only hypothetical. We presented these to concretize the framework and design implications. While the framework and resultant design implications are drawn from our participants' experiences (and so the hypothetical is presented for explanatory purposes), future

research is needed to validate the framework beyond the focus group data and analysis conducted here.

Finally, our design suggestions are drawn from combining our participants' specific experiences and thoughts and our subsequent interpretations and analyses of those experiences. Related to our first limitation around participant and experience demographics, our suggestions might not work well in other groups or situations not explored in this work.

With these limitations in mind, we acknowledge that the suggestions we present here to inform design are just that – suggestions. Future work should validate the recommendations made here with people who have gone through a break-up. The suggestions here could lead to features that individuals may find helpful, and such validation might uncover other design suggestions to help with post-break-up identity management. Further, this work focused explicitly on non-divorce break-ups, which is just one type of life transition that people might experience and that might be subsequently represented in online spaces. Our framework and design suggestions might be helpful in understanding the decision-making that occurs during other types of relationship ends and life transitions, and future work should investigate the framework's utility in those scenarios.

6 CONCLUSION

Our lives are represented in sociotechnical systems like social media via data. Stitched together in posts and profiles, this data creates an online identity that mirrors the facets of our offline identities. One such facet captured by data is our significant others — the people we love and choose to spend our lives with. However, in the aftermath of such a relationship ending — a break-up — the data that remains online may exhibit an identity presentation that is inaccurate and unwanted. An identity of "we" may be inappropriate when that partnership no longer exists elsewhere.

Invoking the concept of pre-planning for life events like death, in this paper, we investigated people's planned data management practices on social media if their current romantic relationship ended. We found that people were concerned with concepts of past and present identity, and those concerns mapped onto the curatorial philosophies identified in prior work. Extending that work, we introduced the Break-up Identity Decision Framework, which accounts for the decisions people make around data in the aftermath of a break-up, and the subsequent curatorial philosophy they adopt when managing that data.

We discuss the two types of identity presentations that are sought online after a life transition and identify specific factors that impact one's curatorial philosophy in the wake of a break-up.

Using the framework, we then offered six implications for design that social media designers should consider when designing features that help users manage their data. We define each implication and offer concrete design suggestions to illustrate each implication. Through these implications and possible designs, we see it possible to support both revisionists and archivists in achieving their identity goals after experiencing a break-up. We argue that doing so is essential for encouraging well-being and healing after a break-up.

The model we presented here is explicitly tailored to data management in the wake of a break-up. Yet, many types of break-ups are not captured in our data, let alone the myriad of life transitions that individuals go through. Future work might consider exploring the utility of our data management framework in explaining the data management practices people undertake in the wake of other kinds of life transitions. Different types of curatorial philosophies may emerge, as well as other factors that play a significant role in an individual's data management decisions. For instance, the challenges faced by a trans or non-binary person are far different (and potentially more dangerous) than those faced by a recently single person. The differences that exist in challenges and the danger associated with those challenges might lend themselves to different data curation approaches and factors that influence those approaches.

Moreover, our framework does not account for what might happen later, well after data management has occurred. As time passes, one's feelings about an ex-partner might shift, and one may feel better about having that facet of their identity publicly available again. While our design suggestions account for this — suggesting features that are not deletion but rather allow for editing — one could imagine an even more extended time period where such features might not be as effective. Here, we imagine an older adult who might want tangible memories of their early adulthood. For instance, a veteran might not want to be reminded of their service in the direct aftermath of that service but later may like to share those experiences with grandchildren (or have an easier way of reconnecting with others who were part of their time in the service). Designing for longevity remains a challenge for both revisionists and archivists and one not accounted for in our framework.

While break-ups will never cease to be problematic — whether from a logistical or emotional standpoint, the implications for design and concrete suggestions we present here may enable people to better disentangle from each other after a break-up, and curate a post-break-up exhibition that aligns with their post-break-up goals — whether that is honoring that the relationship happened, or preparing to move on to their next relationship.

ACKNOWLEDGMENTS

We thank our participants for sharing their thoughts and experiences with us – without them this work would not be possible. We appreciate the feedback and suggestions that members of CU's Identity Lab gave as we prepared this manuscript. Specifically, thanks to Katy Weathington and Mally Dietrich for their helpful suggestions. We also acknowledge and thank our reviewers for their thoughtful feedback that improved this paper. The short title of this paper comes from the song "My Backwards Walk" by Frightened Rabbit, from their 2008 album "The Midnight Organ Fight."

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Received January 2023; revised July 2023; accepted November 2023