DESIGN FOR RELATIONSHIP BREAK UPS: CURATION OF DIGITAL POSSESSIONS

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CANDIDATE DECLARATION: UNIVERSITY OF DUNDEE

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I, Daniel Herron, hereby declare that I am the author of this thesis; that I have consulted all references cited within; that I carried out the work recorded in this thesis; and that it has not been previously accepted for a degree.

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I, Daniel Herron, declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Engineering & IT at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of the requirements for a degree at any other academic institution except as fully acknowledged within the text. This thesis is the result of a Collaborative Doctoral Research Degree program with the University of Dundee.

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As I have studied at two universities, been assessed by two universities, and submitted this thesis to two universities, it seems only fitting that I make two dedications in this thesis.

For Shauna

My person.

In this, as in most things, I couldn't have done it without you.

Nor would I have.

--

For Mum, Dad, Aideen, John, Katie, James, Ellen, Niall, and of course, Rupert

You've all put up with me talking about this for five years, so I think a dedication is only fair.

ABSTRACT

Individuals in a romantic relationship will typically have a substantial number of digital possessions associated with that relationship. With online dating services becoming a more mainstream way of meeting a potential partner, sometimes individuals begin creating digital possessions connected to their relationship before even meeting in real life. These digital possessions connect partners by contributing to their digital identities as 'individuals in a relationship'; they are an important part of a digital connection between partners, and actively contribute to the maintenance of that connection.

If a romantic relationship ends in a break up, separation, or divorce, the digital possessions that once connected partners in a positive way become responsible for maintaining a connection that no longer accurately reflects the ex-partners' relationship status. The persistence of digital possessions means that until they are managed or curated in some way, those digital possessions will continue to connect ex-partners in a digital context. The tools and options available to ex-partners when it comes to managing and curating their digital possessions in the context of a relationship break up are limited, and often do not support the specific intent of the individual.

In this doctoral thesis, I investigated the ways in which technology could support individuals in managing and curating their digital possessions associated with a past relationship, after that relationship has ended. Through four qualitative studies, this research made the following contributions to knowledge:

1. The introduction and evaluation of eight prototype grammars of action, which can be used to better support individuals in managing and curating their digital possessions in the context of a relationship break up;
2. Documentation of a reproducible method for identifying contextually relevant design dimensions to guide the development of grammars of

action for the curation and management of digital possessions across different life transitions (including romantic relationship break up);

3. Findings from 8 semi-structured interviews with individuals who had experienced a romantic relationship break up. These findings demonstrate an understanding of the ways in which an individuals' attitude towards digital possessions change after a relationship break up, including the identification of 'tainted' digital possessions;
4. Findings from 10 semi-structured interviews with individuals who had experienced a romantic relationship break up. These findings demonstrate an understanding of the current technological limitations that individuals are confronted with when attempting to curate and manage their digital possessions after a relationship break up.

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PUBLICATIONS BY DANIEL HERRON

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DOI: http://dx.doi.org/10.1145/3170427.3186547

Herron D., Moncur W., van den Hoven E. (2017) Digital Decoupling and Disentangling: Towards Design for Romantic Break Up. In *Proceedings of Designing Interactive Systems*. Edinburgh, Scotland. DIS'17[2].
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DOI: http://dx.doi.org/10.3233/978-1-61499-798-6-175

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Honourable Mention Award

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INTRODUCTION

CHAPTER SUMMARY

In this chapter I introduce the problem that I aim to solve in this thesis: the management and curation of an individual's digital possessions after a romantic relationship comes to an end. This chapter also details the aims of this PhD research and outlines the structure of this thesis, chapter-by-chapter.

1.1 Problem Statement

Relationships enacted in a digital context will typically see partners accrue a substantial number of digital possessions. Individuals in romantic relationships now engage in and maintain their relationships in a digital context as much as in the real world. Online dating services have become a widely accepted and mainstream method of finding a partner, so much so that it is not unusual for relationships to begin over a digital medium. By generating digital content both offline (e.g. taking photos or making videos on a smartphone) and online (e.g. writing posts on social networking sites (SNS) or sending messages through communication technologies such as Facebook Messenger or WhatsApp), individuals weave together their digital presences, creating digital identities for themselves as individuals 'in a relationship'.

While in a relationship, this entangling of digital presences serves a positive purpose in connecting partners together. However, when a relationship comes to an end, all of the digital possessions acting as connections can become a burden. These digital possessions, which previously contributed to an individual's identity as a partner in a relationship, do not just disappear. Instead, the persistence of digital possessions often requires that an individual manage and curate each possession as part of disconnecting from their ex-partner and moving on. The tools that are available for individuals seeking to manage and curate their digital possessions in the context of a relationship break up are limited in their functionality, and individuals faced with this problem often leave the task incomplete.

1.2 Research Aim

The core aim of the research described in this thesis was to investigate the ways in which technology can assist individuals in managing and curating their digital possessions relating to a past relationship after that relationship has ended. In order to achieve this aim, I answered the following research questions:

RQ1. How does an individual's perspective on their digital possessions change after a relationship break up?

RQ2. How are digital possessions relating to a relationship managed (or not) after a relationship break up?

RQ3. How can interaction design support the management of digital possessions after a relationship break up?

1.3 THESIS STRUCTURE

In *Chapter 2* of this thesis I set out the background and motivation for conducting this research and introduce related research in the fields of Human-Computer Interaction and Interaction Design. My research approach is outlined in *Chapter 3*, detailing methods and methodologies employed in this work. In *Chapters 4, 5, 6, and 7* I outline the four research studies that answer the questions presented above. In *Chapter 4* I outline exploratory research investigating the experience of breaking up in a digital context, with a focus on individuals' attitudes towards their digital possessions and how and why they change (or stay the same) after a break up.

The resulting opportunities for design informed the research detailed in *Chapter 5*, which examined the purpose and use of digital possessions after a break up, in order to understand how management and curation of digital possessions could facilitate disconnecting from an ex-partner in a digital context. *Chapter 6* documents research that explores the ways in which individuals are currently limited by technology in how they can manage and curate digital possessions after a break up, and presents design dimensions to guide the design of new methods of interaction that address these limitations.

In *Chapter 7* I outline the processes used to generate design concepts and prototype methods of interaction that enable individuals to manage and curate their digital possessions after a break up in a meaningful way. I also present an evaluation of these prototypes. I reflect on this research and its contributions in *Chapter 8,* where this thesis concludes, and potential future research areas are highlighted.

CHAPTER 2.
BACKGROUND & RELATED WORK

CHAPTER SUMMARY

In the previous chapter, the aims of the thesis were presented, and the structure of the thesis outlined. In this chapter, I explore the background and related work around romantic relationship break up as an area of interest. I introduce the fields of Human-Computer Interaction and Interaction Design; explore the concept of life transitions with a specific focus on romantic relationship break up; examine identity and digital possessions, and how they are connected; and, finally, explore relationships and break ups in a post-digital world.

2.1 INTRODUCTION

The research documented in this thesis sits primarily in the field of Human-Computer Interaction (HCI). HCI research is a field focused on understanding and critically evaluating the interactive technologies people use and experience (Carroll, 2013). As a field, HCI has a tremendously broad scope, drawing on interests and expertise in disciplines such as psychology, sociology, anthropology, cognitive science, computer science, and linguistics (MacKenzie, 2012). There are numerous areas of study within the field of HCI, but this thesis is particularly concerned with HCI as it attends to the human experience – specifically, the influence of technology on the experience of a romantic relationship ending. This PhD also sits within the field of Interaction Design (IxD), in that the research works towards creating new methods by which people can interact with and manage their digital possessions after a break up. In this thesis I refer to IxD as the study of creating user experiences that enhance and augment the way that people communicate and interact (Rogers et al., 2011).

In this chapter, I will explore the phenomenon of *life transitions* (specifically focusing on understanding this phenomenon in the context of HCI), the connected concepts of *identity* (both digitally and non-digitally) and *digital possessions*, and finally the experiences of entering into a *romantic relationship* and *breaking up* in a *post-digital world*[8].

2.2 LIFE TRANSITIONS

The concept of life transitions has been defined by Brammer as a 'sharp discontinuation with previous life events' that involves letting go of past experiences and taking hold of new values, relationships, and behaviours (Brammer, 1992). Life transitions can be divided up into two categories: anticipated transitions, which are scheduled and expected events that can be anticipated and rehearsed (such as graduating from high school or starting a new job); and unanticipated transitions, which are non-scheduled events that are not predictable (Schlossberg, 1981) (such as the focus of this thesis: romantic relationship break ups). The study of life transitions has been, and continues to be, a research focus in the fields of counselling (Brammer, 1992; Bussolari & Goodell, 2009; Lane, 2015), psychology

[8] Post-digital is a state of being in which an individual assumes the digital instead of marveling at it. A post-digital world is a world in which the digital is commonplace and accepted.

(Cantor et al., 1987; Compas et al., 1986; Lee & Gramotnev, 2007), sociology (George, 1993; Heinz & Marshall, n.d.; Iyer et al., 2009), and HCI.

The study of life transitions in the context of Human-Computer Interaction focuses on the ways in which technology can influence or impact an individual's experience of that life transition and spans numerous types of transitions across the human life span. These include moving from high school to college (DeAndrea et al., 2012; Morioka et al., 2016; Smith et al., 2012), moving to a new home (Shklovski et al., 2008), transitioning into and out of the military (Dosono et al., 2017; B. Semaan et al., 2017; B. C. Semaan et al., 2016), going from incarceration to citizen life (Ogbonnaya-Ogburu et al., 2018), becoming a mother (Gibson & Hanson, 2013), losing a pregnancy (Andalibi & Forte, 2018), getting married (Massimi et al., 2014), transitioning to a distributed family as a result of separation or divorce (Odom et al., 2010; Yarosh et al., 2009; Yarosh & Abowd, 2011), gender transition (O. Haimson, 2018; O. L. Haimson, Brubaker, et al., 2015; O. L. Haimson et al., 2016), and experiencing the death of a loved one (Brubaker et al., 2013; Massimi, 2013; Moncur et al., 2012). Despite the diversity of the experiences explored in this HCI research, a common theme across this body of work is the ways in which technology can support individuals experiencing a life transition in finding a '*new normal'* (Massimi et al., 2012): a reconfigured lifestyle where old social and technological infrastructures have been replaced by new social groups and resources.

The focus of this thesis is on one life transition in particular: romantic relationship break up. Although there are no statistics for non-formalised relationship break ups in the UK (i.e. cohabiting partners or individuals romantically involved with one another), statistics for formalised relationship dissolution in the UK (e.g. marriages and civil partnerships ending in divorce) are available from the British Government Office for National Statistics (*Divorce Figures - Office for National Statistics*, 2014). In 2017 101,669 heterosexual couples and 338 same-sex couples ended their marriages, a decrease of 4.5% and an increase of 202% respectively from the same statistics in 2016. Similarly, the number of civil partnerships that came to an end in 2017 was 1,217, a decrease of 7.3% from 2016 (*Civil Partnerships in England and Wales - Office for National Statistics*, 2018).

Break ups as a life transition have been studied from a social and clinical psychology perspective, where researchers have examined the process of a

relationship ending, as well as the impact a break up can have on an individual's wellbeing. Whereas some life transitions can be considered an event that takes place in a moment or on a particular day (such as an individual beginning or ending a job), a romantic relationship coming to an end is a life transition that takes place over a longer period of time. Amato describes a relationship break up not as a series of discrete events, but as a process that begins with feelings of estrangement during a relationship, and continues on until after partners are no longer cohabiting, or in the case of individuals in a marriage or civil partnership, until after they are divorced (Amato, 2000). Markers of successful adjustment to a new normal after a relationship break up include an individual functioning well in a new family, work, or school role, and the individual having developed an identity and lifestyle that is no longer tied to their past relationship (Kitson & Holmes, 1992; Kitson & Morgan, 1990).

The process of ending a romantic relationship brings with it a number of stressors that former partners have to come to terms with, such as a loss of emotional support (Amato, 2000). In an exploration of the impact a break up has on unmarried partners, Galena et al found that this type of life transition was related to an increase in psychological distress and a decline in life satisfaction: over 43% of individuals involved in a relationship break up report this negative impact when compared to their levels of psychological distress and life satisfaction prior to their relationship ending (Rhoades et al., 2011).

In the context of HCI, research has been carried out in several areas related to relationship break up. In Gershon's work exploring media ideologies in the context of communicating information about a relationship, she found that the medium through which a break up is communicated is an important and relatively typical part of the average American college student's break up narrative (Gershon, 2010). When an individual breaks up with a partner by email, that they chose that medium to do so matters; they made a choice to use email, rather than communicating their decision over the phone, by voice mail, through instant messaging, or by letter. Gershon found that an individual ending a relationship through new media (or at least new at the time this work was published) such as Facebook carried implications that the initiator did not fully comprehend until after they ended the relationship. The act of breaking up over new media could signal the initiator's cowardice, lack of respect, callousness, or indifference from the perspective of the

receiver, as the subtle connotations of Facebook's use at the end of a relationship were not yet understood by its users (Gershon, 2010).

While also exploring the ways in which college students communicated with their ex-partners on Facebook, Lyndon et al discovered three dimensions of use that these individuals adopted: venting, covert provocation, and public harassment (Lyndon et al., 2011). These three dimensions ranged in severity, with covert provocation considered the least severe, and public harassment considered the most. Individuals engaged in the less severe behaviours more than they did the more severe behaviours; for example, 67% of participants reported engaging in covert provocation, where an individual interacts with an ex-partner in a passive fashion (such as looking through an ex-partner's photos or updating their status in an attempt to make an ex-partner jealous). Only 18% of participants reported harassing an ex-partner on Facebook, engaging in activities such as creating a false profile imitating an ex-partner to cause problems, or using Facebook to spread false rumours about an ex-partner (although this may be because participants were less likely to admit to more severe behaviours).

Social networking sites like Facebook provide strong platforms for these kinds of post-break up behaviours because of the access they provide to an ex-partner. When this access is combined with the invisibility a SNS offers individuals when they're accessing information about, or belonging to, an ex-partner, sites like Facebook become effective tools for surveillance after a break up (Tong, 2013). Surveillance of ex-partners on Facebook, or 'Facebook stalking', has become fairly common practice, despite the negative effect it can have on the individual engaging in the activity (Marshall, 2012); continued contact online with ex-partners, or engaging in surveillance of an ex-partner was found to inhibit post-break up recovery and personal growth. Frequent monitoring of an ex-partner on Facebook has also associated with greater distress over the break up, an increase in negative feelings, and greater sexual desire and longing for the ex-partner (Fox & Tokunaga, 2015; Lyndon et al., 2011; Marshall, 2012; Tong, 2013).

Perhaps the most relevant HCI research to this thesis is Sas and Whitaker's work on digital curation. Curation as a concept can broadly be thought of as the selection, organisation, and presentation of things (*Curation - Google Search*, n.d.) - whether the perspective is that of a museum curator designing an exhibition, or an advertiser creating an advert. In this thesis, curation is discussed in the context of digital

possessions and tied to digital identity, where individuals carefully manage their digital presentation of self through the process of selective presentation of self in digital venues (Hogan, 2010). I further examine the process of curating a digital identity in the next section of this chapter.

When a relationship ends, collections of digital things are typically managed as an act of symbolic detachment, where ex-partners attempt to regain a sense of self through curation (Sas & Whittaker, 2013). Sas and Whitaker found that, while curating their collection of digital things, ex-partners may adopt a particular curation role: a '*Deleter'*, who disposes of their digital collection completely; a '*Keeper'*, who retains the entire digital collection; or a '*Selective Disposer'*, who engages in a hybrid strategy of deleting and retaining certain digital possessions.

Sas and Whitaker's curation roles revolve around saving and deleting digital things, highlighting that there are limitations around the ways in which individuals can currently curate or manage digital things. This limited range of interactions is directly addressed by the work of this PhD thesis.

In their research, Sas and Whitaker highlight that the curation of digital things post-break up is an important part of ex-partners re-establishing their identities as individuals rather than as partners in a relationship (Sas & Whittaker, 2013). The HCI research around relationship break ups as life transitions is connected to the concept of identity, which, in a digital context, is entwined with the concept of digital possessions. To fully explore this research space, I will next discuss these subjects and how they relate to one another.

2.3 (Digital) Identity and Digital Possessions

The definition of identity is difficult to articulate as it changes across the different fields in which it is relevant (Taylor, 1989); in the realms of social psychology, it has been argued that identity is an individual's concept of who they are and how they relate to other people (Abrams & Hogg, 2006). This is shared from an anthropological viewpoint, where identity has been seen as a mutable process whereby individuals define themselves by their relationship to others (Hall, 1996). However, the notion that an individual's identity encompasses how they relate to other people is not a primary focus when defining identity from a political and social sciences perspective, where it has been described as an understanding of a set of expectations about the self (Wendt, 1999).

Identity has also been viewed as a concrete categorisation of individuals and groups within political science, where an individual's identity is defined by race, ethnicity, religion, language, and culture (Deng, 1995). By analysing different definitions of identity and their use across multiple fields and contexts, Fearon defines identity as "*a set of attributes, beliefs, desires, or principles of action that a person thinks distinguishes themselves in a socially relevant way*" (Fearon, 1999); in essence, he defines an individual's identity as the answer to the question 'who am I?' across a variety of contexts.

Individuals are theorised to have a variety of identities that make up their sense of self. These faceted identities are shaped by different social contexts where an individual adopts certain roles (Abrams & Hogg, 2004; Tajfel, 1978). Examples of these are familial roles (such as a mother), occupational roles (such as a teacher), or relationship roles (such as a member of a peer group) (Heiss, 1990). Socially successful behaviour is viewed differently in each of these contexts, so individuals present the most appropriate facet of their identity that will be seen as most socially acceptable depending on the context; this is known as impression management (Goffman, 1959).

The notion that individuals present different facets of their identity depending on their current social setting also translates to a digital context. In an analysis of online identity and interaction practices, Bullingham et al. found that while bloggers and individuals using Second Life[9] base their online personas on their offline self, they build their online persona using facets of their offline identity to allow them to conform and fit in to their virtual social setting (Bullingham & Vasconcelos, 2013). As faceted identities appear in a digital context, so too does impression management: Trammel et al analysed the content of 209 A-list blogs (where a blog is considered A-list if it is linked to from at least 100 other blogs) and found that bloggers engaged in tactics designed to make them appear competent and likeable, such as praising others, addressing their audience directly, and using experts to back up their opinions (Trammell & Keshelashvili, 2005). Similarly, individuals have been observed to present different facets of their identity on location-based real-time dating apps (such as Tinder) depending on their motives for using the service;

[9] Second Life is an online virtual world where users can create, connect, and chat with other people from around the world via virtual representations of themselves called avatars. Second Life is not considered a game, and users use it to socialise, learn, and even make real-world money.

whether an individual is interested in finding casual sex, a friendship, or a serious relationship will affect their self-presentation in this digital context (Ranzini & Lutz, 2017).

Where impression management in the non-virtual world often relies on maintaining different physical contexts for different social settings, online contexts are more permeable and can lead to awkward situations where these social settings collide. As with offline impression management, these issues can be managed in a digital context by segmenting areas of an individual's life. For example, a person may maintain multiple email addresses to use across different social groups or settings (Gross & Churchill, 2007), or use different social networking sites for different purposes, e.g. LinkedIn for professional networking and Facebook for personal connections (Schrammel et al., 2009); others have been seen to present multiple presentations of self on one platform (DiMicco & Millen, 2007). In Farnham et al's exploration of the challenges individuals face when engaging in online impression management across different digital social settings, they found that managing incompatible identity facets in a digital context was stressful and resulted in increased levels of self-reported worry among participants (Farnham & Churchill, 2011).

In a non-digital context, an individual's identity can be defined by, and shared via, material possessions. Possessions in the physical world have been found to play a role in creating, maintaining and preserving the identity of individuals in different ways across the lifespan (Dittmar, 1992; Solomon, 1983). As an individual grows older and their identity evolves, they develop and curate a set of possessions that they believe represents their self; or, the self they want to project to others (Hirschman & Holbrook, 1981). As material possessions contribute to an individual's offline identity, so too do digital possessions contribute to an individual's digital identity by establishing their sense of self and enabling them to connect with others in a digital context (Odom et al., 2012); for example, sharing photographs online has frequently been observed as a common method of expression of an individual's identity in digital contexts (Graham et al., 2011; Mendelson & Papacharissi, 2011; Sarvas & Frohlich, 2011).

In this thesis, I use the term digital possessions to collectively refer to several types of digital materials, including images, videos, chat histories, emails, social media posts, meta-data, login credentials, text messages, shared accounts, and more

(Odom et al., 2010; Sas & Whittaker, 2013). Although digital possession as a term describes a broad range of digital materials, the unifying factor across different types of digital possessions is a sense of ownership, where the digital possessions belong to an individual.

Past research has observed how digital possessions can be 'ensouled', where an individual forms strong attachments to their digital possessions as a result of how meaningful those possessions are to them (Odom et al., 2009). Although this is not typical of every digital possession, ensouled digital possessions can become extensions of the self, triggering attachment much the same as meaningful physical possessions (Kirk & Sellen, 2010; Massimi et al., 2011; Odom et al., 2011).

As portable technologies like smart phones and tablets continue to evolve and offer increased storage capacity at lower costs, individuals can easily amass a comprehensive collection of digital possessions, the sheer volume of which can become overwhelming (House & Churchill, 2008). These collections of digital possessions contribute to their owner's digital expression of self (Kirk & Sellen, 2010), documenting experiences and preferences that become the basis for their digital identity.

In their research exploring the nature of a file, Harper et al. discuss the limited ways in which individuals can interact with digital things. They highlight that, with the advent of social networking sites, new data types (such as 'likes' and 'comments') arise that do not fit the standard definition of being a file, but instead are more file-like (Harper et al., 2013). For example, would copying a photograph on Facebook make a full duplicate of that photograph, including a record of all its comments, likes, and shares, or would it duplicate only the image in question, thereby creating a distinct, lesser version of the digital possession? The authors conclude their research by going beyond their original call to re-examine current grammars of action and highlighting the importance of context-specific actions that resolve issues faced by individuals in the modern-day digital landscape; for example, the focus of this thesis: ex-partners managing their digital possessions after a relationship break up.

With this shift, Harper et al. stress a need for the research and design communities to re-examine current grammars of action. Grammars of action, put simply, are the types of action that can be taken on a file; classic grammars of action include

create, edit, save, and delete. Harper et al. explain that in a grammar of action, the word (or grammar) describes the physical action taken by a user but does so in a way that relieves that user from understanding the mechanics involved in the action – instead, they can focus on the result. For example, when a file is saved, bytes are moved from a machine's RAM and stored on a disk, potentially non-consecutively. By referred to this process by the 'save' grammar of action, the user can simply understand that their changes have now been stored, and they can safely close whatever file they were working on.

In order to effectively design new grammars of action for ex-partners managing their digital possessions after a relationship break up (and thereby managing their digital identity), it is important to understand the experiences in a digital context of finding a partner, enacting a romantic relationship, and breaking up.

2.4 Post-Digital Relationships and Break Ups

As people enact romantic relationships both on and offline, digital technologies have become more and more integrated into the experience. In this section, I will explore the ways in which digital technologies such as online dating services, social media, and various communication and curation apps have drastically changed the ways in which potential partners meet, and engage with one another during a relationship, and break up.

When it comes to the search for a potential partner, online dating services, including sites like Match.com and OKCupid and apps like Tinder and Grindr, have replaced personal ads or meeting at a bar as the most popular way to meet a partner (Rosenfeld et al., 2019). Match.com claims that 1 in 3 relationships now begin online (Match.com, n.d.), and that 1 in 5 marriages are a result of their online dating site. Similarly, Tinder claims that it is responsible for one million dates per week across the 190 countries it is available in (*Tinder - Press*, n.d.).

A recent study carried out by Rosenfeld et al found that about 65% of same-sex couples and 39% of heterosexual couples in the US in 2017 met online (Rosenfeld et al., 2019). Research shows that the popularity of these online dating services derives from three key services that they provide individuals: access, communication, and matching (Finkel et al., 2012). Access refers to users' exposure to potential partners that they might not otherwise come into contact with, as well as their opportunity to evaluate those people; communication refers to users'

opportunity to interact with potential partners before meeting face-to-face; and matching refers to a service's ability to match potential partners using mathematical algorithms.

Another explanation for the popularity of online dating services may be the variety of services and the specificity that they offer, with over 800 options catering to specific types of people, fetishes, and motivations (King et al., 2009). For example, elitesingles.com is aimed at 'highly educated people looking for a serious relationship', while sites like ashleymadison.com and philanderers.com help connect individuals that want to engage in affairs; sites like JDate, Muslima, or Christian Mingle match partners based on their religious beliefs; sugardaddies.com links wealthy men to younger women; riders2love.com helps bring bikers together, and gothicmatch.com provides the same service to goths. While motivations for using online dating services vary, this PhD is concerned with the experience of a relationship ending in the context of break up, separation, or divorce, rather than endings experienced in relation to hook-up culture (although attention within the HCI research community has begun to discuss the impact technology has had on casual sex (Birnholtz et al., 2015)).

Digital technologies have been seen to enable partners to express their togetherness while in a relationship through a variety of mediums. By generating digital possessions, partners in a relationship weave together their digital presences. For example, going 'Facebook official' with a partner by updating one's relationship status on Facebook publicly links partners' accounts together, and has been found to not only facilitate romantic interactions, but shape and define the romantic relationship (Bowe, n.d.; Fox & Warber, 2013). Similarly, Zhao et al's research into the ways in which romantic partners use Facebook classified actions such as an individual selecting a profile photo depicting themselves and their partner together, or friending one's partners' friends on social networking sites, are seen as public displays of affection to express togetherness in a digital context (Zhao et al., 2012). These public displays of affection were associated with an increase in relationship commitment for dating couples, which in turn increased their likelihood of remaining together after 6 months (Toma & Choi, 2015).

When partners break up, the digital possessions that announced their togetherness and proclaimed their identity as partners in a relationship do not simply vanish; the persistence of digital possessions requires that the ex-partners intervene in order to

curate and manage them (Moncur et al., 2016). This act of managing collections of digital possessions after a break up has been observed as an attempt by ex-partners to regain their individual sense of selves (Sas & Whittaker, 2013), and is considered an important step towards moving on (Slotter et al., 2010). During this life transition, an individual can experience an unclear sense of self; their identity as a partner in a relationship is no longer accurate, and they need to construct a new identity as an individual (Slotter et al., 2010).

There are some digital technologies that aim to support individuals experiencing a romantic break up. As a platform where individuals have many opportunities to announce and share romantic relationships, Facebook suggests a variety of actions that individuals can take on the site after a break up (*My Romantic Relationship Ended. What Can I Do on Facebook? | Facebook Help Centre*, n.d.). The company offers guides on how to reduce contact with an ex-partner, including ways to: reduce how much an individual sees of their ex-partner's content; limit how much of the individual's content an ex-partner can see; update the individual's profile photo; archive the individual's message thread with their ex-partner; and block or unfriend the individual's ex-partner. Although Facebook also offers guidance on how to turn on an approvals process for being tagged in photos and posts, they do not offer any guidance for individuals to curate digital possessions in the context of a break up.

The majority of applications aimed at individuals who have experienced a relationship break up focus on adopting positive lifestyle changes to support moving on in a healthy way. Rx Breakup[10], for example, is an app that aims to guide individuals experiencing a break up towards adopting positive practices that improve mental wellbeing, designed to be used in the 30 days following the end of a relationship. Other examples of similar applications include Mend, X your Ex, and Break-Up Boss.

Less numerous are the applications that focus on managing and curating digital possessions in the wake of a relationship break up. Killswitch[11], for example, is an app that presents itself as being able to '*seamlessly and discreetly remove traces of your ex-partner from your Facebook profile, so you can move on'*. The app removes photographs, videos, wall posts, and status updates that an ex-partner has been tagged in from an individual's Facebook profile, to distance them from their ex-

[10] www.rxbreakup.com
[11] www.killswitchapp.com

partner. Killswitch provides little nuance in what an individual can achieve by using the app; it is a quick way to delete digital possessions connected to an ex-partner and does not support individuals in any other type of curation or management activity.

Shryne[12] is an app that currently supports individuals in strengthening social connections but was previously billed as a space for individuals to create a '*shrine*' to an ex-partner. This was achieved by supporting individuals in gathering all of their digital possessions relating to an ex-partner in one centralised location and making those digital possessions searchable (Harrison, 2016). As with Killswitch, Shryne had a singular purpose: saving digital possessions, with no thought for any curation or management actions beyond hoarding.

This section shows that technology plays a role throughout the experience of being in a romantic relationship in a post-digital world, from finding a partner to maintaining and even publicising a romantic connection. Digital technologies are effective at connecting people and helping partners maintain their relationships but are limited in their ability to support individuals in disconnecting from one another at the end of a relationship.

2.5 Conclusion

The act of managing and curating digital possessions from a past relationship is not well understood as part of the experience of relationship break up in a digital context. Digital possessions are the building blocks of an individual's digital identity; in order to maintain an accurate representation of self in a post-break up digital context, it is important for ex-partners to be able to manage and curate their digital possessions appropriately beyond typical grammars of action such as save, update, delete, and share.

Individuals often become digitally entangled as part of being in a relationship, with digital possessions building identities for partners as being 'together'. In the preceding sections of this chapter, I have outlined the focus of previous HCI research pertaining to relationship break ups: which explored how individuals communicate their desire to end a relationship using technology; the strategies people employ to seek continued contact with an ex-partner post-break up; and the

[12] www.shryne.com

ways in which people approach the curation of their digital possessions after a relationship ends.

None of the research in this space suggests how we can better support ex-partners in practically managing and curating their digital possessions after a relationship ends. There are several gaps in knowledge that my research addresses to support the design of effective grammars of action in this space:

1. How a break up changes peoples' attitudes towards their digital possessions;
2. The practicalities of current-day management and curation of digital possessions post-break up;
3. Documentation of the limitations in the current curation experience from the ex-partner perspective.

Each of these gaps is addressed by the research documented in Chapters 4, 5, and 6 respectively, culminating in the design and evaluation of new methods of managing and curating digital possessions in Chapter 7 of this thesis.

In the next chapter I outline my approach to this research, discussing the ethical implications of this work and my approach to inclusive participant recruitment. I also highlight the research methods employed and methodology adopted to conduct this research, and the rationale for selecting each.

CHAPTER 3.
RESEARCH APPROACH

CHAPTER SUMMARY

In this chapter, I introduce the research approach for the studies that make up this thesis. My approach and decision-making process for achieving ethical approval and engaging in diverse participant recruitment is outlined. I also discuss my rationale for adopting my research methodology, data gathering methods, analysis methods, and design method, as well as the specific processes I engaged in for each of these methods when relevant.

3.1 INTRODUCTION

The aim of this thesis is to understand how technology can support individuals in managing and curating their digital possessions that relate to a past relationship after that relationship has ended. In order to build an understanding of the very human issues surrounding a relationship break up in a post-digital era, I decided to approach this work using methods from the fields of Human-Computer Interaction (HCI) and Interaction Design (IxD). As mentioned in the previous chapter, HCI and IxD are two fields focused on the study of how people interact with technology, and how user experiences can enhance and augment those interactions (MacKenzie, 2012; Rogers et al., 2011).

I decided to approach my research questions qualitatively, as the aim of this work required me to understand the *experience* of romantic relationship dissolution in a digital context, in order to improve upon it. This decision was made in order to keep the research focused on the richness of the individual experiences that characterise these deeply personal experiences from the perspective of my participants (Minichiello, 1990).

I adopted an Experience-Centred Design (ECD) methodological approach to conduct this research, relying on semi-structured interviews to gather data across my first, second, and third studies (as reported on in chapters 4, 5, and 6 respectively). Adopting semi-structured interviews to understand peoples' experiences is typical of diverse HCI research (Kirk et al., 2016; Nassir & Leong, 2017; Wang et al., 2012), especially when investigating lived experiences in various sensitive contexts (Andalibi & Forte, 2018; O. Haimson, 2018; Kazakos et al., 2013; Odom et al., 2010; Ogbonnaya-Ogburu et al., 2018), and my research was similarly designed to predominantly gather data this way. I used thematic analysis in my first study before transitioning to affinity diagramming to analyse the data in my second and third studies; the rationale for this change is outlined in section 3.6 of this chapter.

In my fourth study (reported on in chapter 7), I ran design workshops to co-create initial concepts for new grammars of action. I then iteratively developed these concepts into high-fidelity prototypes specifically designed for managing and curating digital possessions in the context of a relationship break up. Using design workshops to leverage the insight of people who have an interest (or expert

knowledge) in a domain to inform design is common in HCI research (Georgiou et al., 2020; Long et al., 2017; Nissen et al., 2018); my approach to design workshops involved as many participants as possible who had personal experience relevant to the research space (i.e. relationship break ups), similar to previous research aimed at designing technology for a specific population (Almohamed et al., 2018). I subsequently gathered feedback on these prototypes through evaluation sessions.

A visual overview of my study design can be seen in Figure 1 below.

In this chapter, I will discuss my rationale for adopting each of these research methods and methodologies, and document their implementation. I will also discuss my approach to considering the ethical implications of carrying out research in this sensitive context, as well as my approach to inclusive participant recruitment.

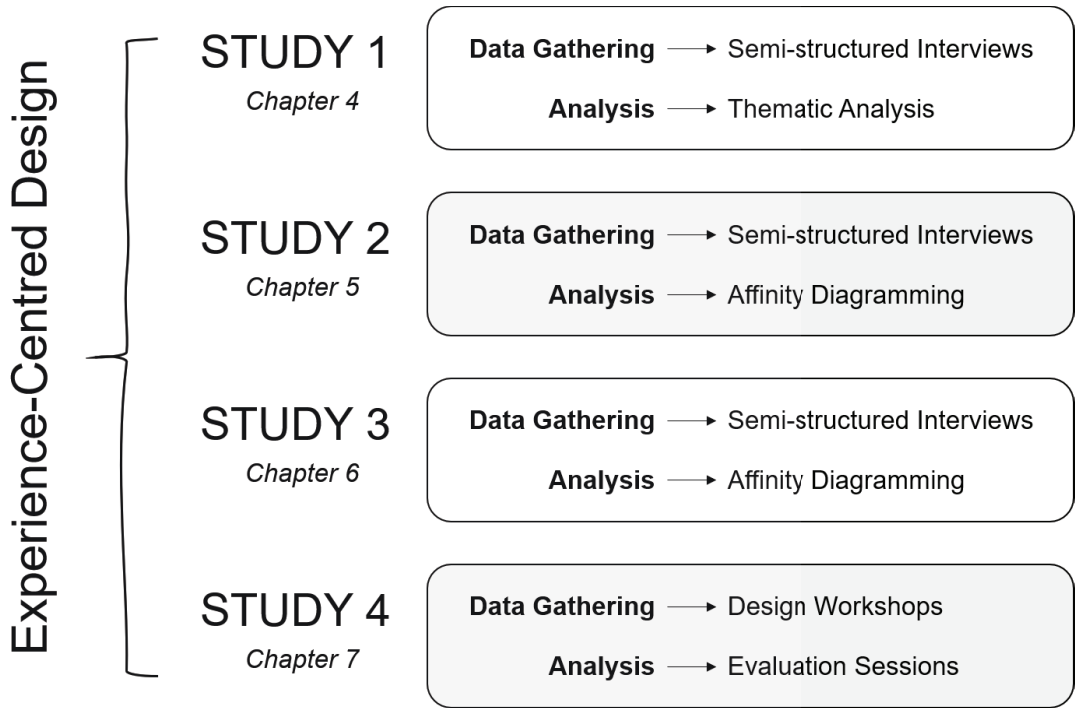

Figure 1: A summary of the research methodology and data-gathering and analysis methods employed in each study comprising this thesis.

3.2 Ethical Approval

The research documented in this thesis was approved by both the University of Dundee and the University of Technology Sydney's ethics committees; as this was a joint-PhD, an agreement between the two universities allowed for the institution where the research was to be conducted to give or deny ethical approval on behalf of both universities.

The focus of each piece of research that made up this thesis was focused on a deeply personal and sensitive topic. A rigorous ethical approval process was implemented to account for any potential emotional and psychological distress that individuals may have felt by participating in the sessions. As part of this comprehensive approval process, each of the following areas was documented for review by the ethics committee: research aims, research methodology and methods, significance of the work, recruitment strategy and rationale, consent procedure, risk assessment, strategies to cope with risk, and additional documentation outlining the procedure for the research (e.g. interview session guides).

This ethical approval process was a way in which I considered the wellbeing of participants throughout this entire PhD and ensured that my research was conducted with ethical best practice in mind. For example, contact details for free emotional support services (The Samaritans) were brought to each session with participants, in case they needed professional support with their experiences. From the perspective of researcher wellbeing, a debrief process was put in place between myself and my supervisors, should I be exposed to difficult or triggering experiences while conducting sessions. The letters of approval for each research study that make up this thesis can be found in Appendix A.

3.3 Participant Recruitment

While designing the first study documented in this thesis, Exploring the Experience of Digital Break Ups (Chapter 4), I decided that this research would look beyond the heterosexual perspective of the experience of romantic relationship break up. It was important that solutions derived from this research support any individual experiencing a break up, irrespective of sexual orientation, gender identity, or relationship preferences. To ensure that I gathered an inclusive perspective in this research, I did not restrict participation based on these criteria.

Across all of my research studies, the majority of participants were heterosexual cis male and female, however, I recruited lesbian, gay, and bisexual (LGB) participants throughout this work. Of the participant experiences gathered across the 38 interview and evaluation sessions that make up this research, 6 sessions focused on the experiences and opinions of LGB individuals. This equates to LGB participants making up 16% of the perspectives shared in this thesis, which is more

than representative in comparison to the national percentage of individuals identifying as LGB in the UK (*Sexual Orientation, UK - Office for National Statistics*, n.d.).

The participants who volunteered to take part in my research discussed their experiences of marriages, civil partnerships, cohabiting, or dating relationships. All my participants were involved in dyadic relationships except one; that single participant was involved in a four- then three-way relationship with two men and a woman, and then one man and one woman.

Sample sizes for the interview and evaluation sessions documented in this thesis ranged from eight participants to 13 participants across the different studies. This is typical of research exploring sensitive contexts, and similar sample sizes can be found in other HCI research exploring intimate subjects (Dimond et al., 2011; O. L. Haimson, Bowser, et al., 2015; Moncur, 2013). Participants in all chapters of this thesis are referred to by an assigned pseudonym, and no real names are used throughout.

Some participants in this research took part in multiple studies; in the interest of clarity, these participants, and the studies they took part in, are listed below:

- Emma-25: Study 1, Study 2, Study 3, and Study 4
- Wilson-22: Study 2, Study 3
- Ava-34: Study 2, Study 3
- Ethan-24: Study 2, Study 3

These participants were not specifically asked to take part in multiple studies, instead reaching out to volunteer at each call for participants. As the aims for each study differed, I approached repeated interviews with these participants with a blank slate; the data gathered was novel across studies, and while their 'break up stories' were the mostly the same, they differed slightly with each retelling. As a result, the introductions to these participants also differ slightly in each chapter, with the focus of their retelling evolving over time.

3.4 Experience-Centred Design

Experience-Centred Design (ECD) is a methodological approach that revolves around developing an understanding of, and designing for, life as a lived and felt experience (Wright & McCarthy, 2010). The focus of research carried out through

an ECD methodology is on understanding the experience of an individual from that individual's own perspective. Other methodological approaches that I considered for this research were User-Centred Design (UCD) and Phenomenology.

UCD is a methodological approach aimed at including user data and the voice of the user at all parts of the design process (Norman, 2002); it places users at the centre of design and evaluation activities and ensures that end products meet user needs (Guerrini, 2011). Adopting a UCD methodology for this research would have allowed for a consistent focus on a user's experience and needs as part of this research and design process; however, this is also true for an ECD approach. The focus of this research was not only on supporting an individual with regards to the management and curation of their digital possessions after a break up; this work also focused on developing an understanding of the experience of relationship dissolution in a digital context. In this regard, I considered ECD to be a more appropriate methodology than UCD.

Building an understanding of the post-digital break up experience was a vital component in answering the research questions posed in the introduction to this thesis; as a result, I also considered adopting Phenomenology as a methodological approach to this research. Phenomenology is a methodology by which researchers can study phenomena that individuals experience in their everyday life without applying preconceptions to those experiences (Sokolowski, 2000). Although both Phenomenology and ECD are well suited to gathering, analysing, and understanding rich, experiential data, I felt ECD was more effective within the context of research on relationship break ups because of its focus on gathering data in the form of stories (Wright & McCarthy, 2010). This dialogical approach to gathering data came naturally to participants, who had previously shared stories surrounding their break ups with friends and family. It also allowed for a shared understanding between myself as the research/audience member and the participants in the retelling of those stories (McCarthy et al., 2006; Wright & McCarthy, 2010).

3.5 Data Gathering

The primary method for gathering participants' stories and recording their experiences in this research was semi-structured interviews. As mentioned previously, a qualitative approach was taken in an effort to build a deep

understanding of these personal experiences. Additionally, I felt that the participant-led nature of semi-structured interviews lent itself well to the ECD methodology, where engaging with participants in storytelling is a primary means of collecting data.

3.5.1 Semi-structured Interviews

I decided to use semi-structured interviews as the primary data gathering technique throughout my PhD research, although I considered using focus groups or more structured interviews to gather data. Focus groups are a method of group discussion traditionally motivated by a need to gather information about user behaviours (Nielsen, 1997), and structured interviews are a method by which participants are asked to respond to as nearly identical a set of stimuli as possible to gather data (Bernard, 2006).

I had three main motivations for employing semi-structured interviews in my work. Firstly, with regards to exploring and investigating the lived experience of a fellow human being, the versatility of semi-structured interviews allowed both myself and the participant the freedom to explore and express themselves (Bernard, 2006). The semi-structured style also allowed for the preparation of session guides (as can be seen in Appendices B, C, D, and E) to guide discussion and ensure research questions were being answered, but allowed for questions to be adapted in order to follow potentially interesting leads and uncover stories that otherwise would not have been gathered. This responsiveness would not have been possible if I had adopted structured interviews, where I would have had to follow an explicit set of instructions across all participants (Bernard, 2006), restricting me from adapting my line of inquiry in the moment.

Secondly, as I was following an ECD approach, I wanted participants to lead the sessions as they shared their stories with me; semi-structured interviews are an ideal method of leading participants to a topic of interest and enabling them to surface what they believe to be important or meaningful (Bernard, 2006). By prompting participants to think of certain types of events and experiences (for example, times that technology failed them in managing digital possessions after a break up), the participants were then free to share their stories in much the same way that they would if they were talking to their friends or family. To maintain this atmosphere of relaxed storytelling, I acted as an audience member during the interviews, probing for additional information, while at the same time steering

conversation back to relevant topics if participants began sharing tangential stories. Although I could have played the role of an audience member using structured interviews, I would have had to play a less active part in that conversation to try and maintain parity across participant sessions.

Finally, I adopted semi-structured interviews because of the ease with which it allowed me to build a rapport with the participants (Bernard, 2006). Building a strong rapport with participants was important due to the very personal nature of the discussions; establishing trust and quickly becoming invested in what the participant shared was key in successfully collecting stories in the sensitive context of relationship break up. This was primarily why I chose not to use focus groups to gather data; it would have been uncomfortable for participants to share these intimate details of their lives in a group setting, and potentially unethical of me to ask them to do so.

3.5.2 Interviews in Sensitive Contexts

As part of the research process, ethical approval was received for each individual study that makes up this thesis. As part of the application for ethical approval, a risk assessment was carried out, and safeguards put in place to protect both myself and the participants. It was stressed in the Information Sheets given to participants, and again in-person before the interviews, that the participants could decline to answer any questions. The participants were also told both on paper and in person that they were free to leave the research study at any time and did not need to give a reason to do so.

During the interviews, I was watchful for any signs of distress from participants. In any instances where those signs were apparent, I offered the participant the opportunity to take a short break from the interview, and, although it was not necessary, I was prepared to terminate the interview in the interest of the participant's wellbeing. I also brought contact details for a free telephone helpline, the Samaritans, in case the participants needed to talk to a professional about any experiences brought up during the interviews.

Participants often shared stories about their experiences that were not relevant from a research perspective but were clearly meaningful to them. I allowed participants to share these stories in the interviews, engaging with them as much as I engaged

with stories that were relevant to the research questions in an effort to make the participants feel cared for during the sessions.

In terms of my own wellbeing as the research, two protocols were put in place. Firstly, as the majority of the interviews throughout this PhD thesis were carried out in the homes of the participants, I made contact with my supervisor in Dundee before and after each interview, to confirm that I was at the participant's address, and had safely left. Secondly, I had the opportunity to schedule time with my supervisors to talk about any difficult interview topics; the sensitive nature of the interviews sometimes resulted in difficult discussions for me as well as the participants, and a debrief with supervisors allowed for processing and sense-making of those experiences (Moncur, 2013).

3.6 Data Analysis

The stories gathered from participants through semi-structured interviews were analysed using two methods across this thesis. Participant data was analysed through thematic analysis in the first research study, with subsequent analysis of participant data from the second and third studies conducted via affinity diagramming. Both of these methods were adopted because of their effectiveness in analysing qualitative data, particularly when working to understand participants' lived experiences (Clarke & Braun, 2013) or analysing complex problem spaces (*Affinity Diagram (What Is It? When Is It Used?) | Data Analysis Tools | Quality Advisor*, n.d.).

I decided to employ affinity diagramming in studies beyond my first following discussions with colleagues about the findings from my first study. As these other researchers read about my work and began to share their thoughts about my results, I realised how valuable it would have been had I been able to leverage their skills and insights during the analysis of that data. As affinity diagramming allows for the perspectives of multiple researchers to be considered during the analysis, I decided to adopt it for the analysis of subsequent interviews. Below, I outline the processes followed for thematic analysis and affinity diagramming in this research.

3.6.1 Thematic Analysis

Thematic Analysis is a method by which researchers search through a qualitative data set to identify and analyse patterns in the data (Braun & Clarke, 2006). I employed thematic analysis according to the process documented by Braun and

Clarke (Braun & Clarke, 2006): interview transcripts were coded using an open coding approach, by which participant data was clustered and organised by theme (Liamputtong & Ezzy, 2005), rather than using a predetermined coding scheme. These coding and grouping activities were employed iteratively until the data was refined and built up into a final set of distinct themes. Each stage of the thematic analysis approach used as part of this PhD research is outlined below.

Becoming Familiar with the Data

In an effort to become familiar with the data, I listened to each interview audio file in its entirety, making a short biography for each participant based on the interview content. The interviews were then manually transcribed verbatim using custom-built software[13]. Transcripts included all verbal and non-verbal (for example, when the participant laughed) utterances, and were anonymised by removing the name of the participant, the names of any people or places mentioned by the participant during the interview, and the names of specific events mentioned by the participant.

Coding

Each interview transcript was imported into nVivo[14], where any quotes deemed to be interesting or relevant in the context of the study's research questions were highlighted and assigned a code. These coded segments were selected with the aim of eventually achieving maximum diversity of potential themes, and surrounding data was often included in coded segments to ensure context was not lost during the analysis.

Searching for Themes

Each set of coded segments was reviewed as part of the iterative process of searching for themes within the data; codes that were similar were merged together, and codes that grew too large were reviewed and broken down into distinct groups, each with a specific focus until a set of initial themes was created.

Reviewing Themes

The themes that resulted from the previous step were reviewed; any themes that were not relevant to the aims of the study were discarded, and the coded segments that comprised the remaining themes checked against the theme name to confirm their validity. These themes made up the final output of the analysis.

[13] Custom-built transcription tool: http://dvangennip.github.io/transcriber/
[14] A qualitative analysis tool: https://www.qsrinternational.com/nvivo/home

3.6.2 Affinity Diagramming

Affinity diagramming is a similar process to thematic analysis, and is often utilised when researchers are working with large qualitative data sets (Beyer & Holtzblatt, 1998). Whereas thematic analysis is typically carried out by an individual researcher (with additional researchers potentially contributing to the thematic analysis in the name of inter-coder reliability), affinity diagramming is a group activity, and as such, can be considered to have inter-coder reliability baked into the process. Each stage of the affinity diagramming technique used as part of this PhD research is outlined below.

Becoming Familiar with the Data

As with thematic analysis, the first step is for the researcher to become familiar with the data. This was achieved in the same way, where I listening to each audio recording in its entirety and creating a short introductory biography for each participant. Subsequently, the interviews were transcribed, and the data anonymised.

Selecting Affinity Notes

I selected quotes from the interview transcripts, termed *affinity notes*, that were judged worthy of exploration, or were related to the aims of the studies. The affinity notes were then divided half to make two sets of data; the first set was used by a team of researchers for the first part of the analysis, and the second set subsequently used by me in the second part of the analysis.

Data Set 1: Sorting and Grouping

A team of researchers physically organised the affinity notes based on the notes' affinity to one another; this was done by the researchers selecting an affinity note and finding other notes that they felt were related. The researchers also gathered a set of affinity notes that they deemed irrelevant to the aim of the research, to be discarded. After all affinity notes had been grouped, the team embarked on an iterative cycle of discussing the grouped affinity notes, reviewing and refining them accordingly, condensing groups together, creating subgroups where necessary, and separating out any groups that became too large to be manageable (Beyer & Holtzblatt, 1998). After three iterations of reviewing and refining, the research team gave each group of affinity notes a name and a clear definition.

Data Set 2: Merging and Iterating

I then analysed the second half of the data using the structure that the team of researchers created as much as possible. Affinity notes were added to the already existing groups, and new groups were created as required, while again discarding any affinity notes that were deemed unrelated to the research aims based on the affinity diagram's structure. I then reviewed and refined all of the affinity groups in an iterative cycle, sorting through each affinity note (including all discarded notes) to ensure that none needed to be moved or placed in a new group.

3.7 Design Methods

Towards the end of the studies that make up this PhD, the focus of the research evolved from simply understanding the perspectives and experiences of individuals who have gone through a relationship break up, and began to focus on creating new grammars of action to support individuals in curating and managing their digital possessions in a post-break up context. To develop these new grammars of action, I ran design workshops with the aim of gathering initial concepts to build into prototypes. I took these initial concepts and developed them into prototypes, the output of which I subsequently evaluated in sessions with participants. The process I followed when using each of these methods is documented below.

3.7.1 Design Workshops

Design workshops are loosely based on focus groups and requirements workshops, as a method by which researchers can gather participant ideas and feedback around the development of potential systems and features (Rogers et al., 2011). Design workshops often include tasks or activities for participants to engage in, and using this design method can result in outputs such as participant-created designs. When deciding what method to adopt in order to explore design dimensions created as part of my research, I considered both design workshops and focus groups. Focus groups are a method of group discussion traditionally motivated by a need to gather information about user behaviours (Nielsen, 1997); although I was interested in gathering the perspectives of multiple people, I had already developed an understanding of potential user behaviours, and instead wanted to adopt a design method aimed at involving participants directly in my design process.

Running design workshops allowed me to explore the design space by engaging participants in a series of activities. I tasked them with suggesting ways in which a

fictional individual could manipulate her collection of digital possessions based on pre-defined needs determined by different combinations of these design dimensions. I wanted participants to produce tangible design concepts, and provided them with pens, paper, markers, scissors, and glue.

To see the session guide, the materials for the workshop, and the activities participants engaged in, see Appendix E.

3.7.2 Prototyping

The design workshops facilitated the creation of interaction concepts, which I then further developed into prototype grammars of action. The concepts were formalised by being developed into a series of low-fidelity paper prototypes, which in turn were developed into a series of high-fidelity digital video prototypes. These video prototypes were used in evaluation sessions with participants to gather feedback on these proposed grammars of action.

The decision to gather feedback using these high-fidelity prototype videos was informed by research into interaction design prototyping. In interaction design prototyping, researchers believe that prototypes should exhibit enough functionality that an intended user could envision further functionality, and that the more functional a prototype, the more effective the discussion and evaluation of that prototype will be (Stolterman, 2008).

3.8 Conclusion

In this chapter, I discussed my approach to running ethical and inclusive research, as well as my rationale for selecting my research methodology, data gathering methods, analysis methods, and design methods as opposed to other potentially relevant methods and methodologies. A summary of the methods and methodologies employed in each study can be seen in Figure 1.

In the following chapters, the specifics of each research study where these methods were employed are documented. These chapters outline the research setup, introduce the participants involved, document the results of the research, and include a discussion of those results for each study.

CHAPTER 4.
EXPLORING THE EXPERIENCE OF DIGITAL BREAK UP

CHAPTER SUMMARY

In the previous chapter, I outlined the methodological approach to this research. This chapter reports on a study involving semi-structured interviews aimed at understanding: (a) the experience of a modern-day relationship break up; (b) the attitudes of individuals towards their digital possessions from a past relationship, as well as (c) whether those attitudes changed as a result of the break up. The interview data was transcribed and analysed using Thematic Analysis, resulting in four themes; 'Digital Possessions that Sustain Relationships'*;* 'Comparing Before and After'*;* 'Tainted Digital Possessions'*; and* 'Digital Possessions and Invasions of Privacy'*. These themes directly informed the development of three opportunities for design;* 'Encouraging Awareness of Digital Possessions'*;* 'Managing Digital Possessions and the Attitudes Towards Them Post-Break Up'*; and* 'Disconnecting and Reconnecting'*.*

This chapter is based on the following publication:

Herron D., Moncur W., van den Hoven E. (2016). *Digital Possessions After a Romantic Break Up*. In Proceedings of the 9th Nordic Conference on Human-Computer Interaction. Gothenburg, Sweden. NordiCHI '16.

4.1 Introduction

As the first study carried out in this PhD, the research reported on in this chapter was primarily exploratory in nature. The aim of this initial study was threefold. Firstly, to develop an understanding of the modern-day break up experience. Secondly, to explore individuals' attitudes towards meaningful digital possessions from past relationships, as a way to understand the effect those digital possessions had on participants' experiences of breaking up. Finally, I aimed to determine if (and if so, in what way) those individuals' attitudes towards their meaningful digital possessions changed as a result of their relationships coming to an end.

4.2 Study Setup

4.2.1 Procedure

Eight semi-structured interviews were carried out with participants on a one-to-one basis. Whenever possible, these interviews took place in the homes of the participants, where they would be surrounded by their belongings and would be able to access their digital possessions. Three interviews (with Andrew-41, Michelle-28, and John-33) could not take place at the participants' homes, however, those participants brought devices (smartphones, laptops) with them to the university, so were able to access their digital possessions as they would have in a home setting.

The interviews were structured in two sections. The first section gathered background information about the participants' relationships. Participants were asked to tell the story of how they met their partner, how and when they started dating, what the relationship was like, and how and why it came to an end. The participants' answers to these questions generated my understanding of the modern-day break up experience, gave context for later participant responses, and at the same time eased the participants into the interview process, encouraging them to reminisce and talk about their past relationships.

The second section of the interviews was the main focus of the sessions, and concentrated on gathering stories about digital possessions that participants considered to be either positive or negative with regards to their ex-partner and past relationship. These stories contributed to my understanding of how the participants' attitudes towards their past relationships and their digital possessions changed as they transitioned from being in a relationship to being single.

In this section, participants were asked to think of up to five meaningful digital possessions with *positive* associations from their previous relationship, and up to five meaningful digital possessions with *negative* associations from their previous relationship. For each digital possession identified by the participants, they were asked a series of follow-up questions: to retrieve and show us the possession where possible; to tell the 'story' of the possession; to explain why they considered the possession to be positive or negative; to share how they felt towards that digital possession now; to share how they felt towards it during their relationship; and, finally, whether or not they had actively accessed the possession since the break up, and why. The full interview guide for this study can be found in Appendix B.

The mean interview time for these eight sessions was one hour and three minutes (with the longest interview lasting one hour and 34 minutes, and the shortest interview taking 41 minutes). Some interviews took longer simply because some participants had more digital possessions to discuss than others.

4.2.2 PARTICIPANTS

A total of eight participants took part in this study. These participants were primarily recruited through a website advertising the research study, with links shared digitally (via email, Facebook, and Twitter). Participants were also recruited locally via posters (in cafes, shopping centres, bars, restaurants, and sports centres), as well as through snowball sampling in two cases. The only inclusion criteria for this study were that (a) the participants were over the age of 18, (b) that the participants had experienced a relationship break up, and (c) that the participants actively used digital technologies and/or social media during the relationship. As with every study in this thesis, no exclusion criteria were set with regards to the type of relationships that participants had to have been engaged in (e.g. marriage, civil partnership, cohabiting, dating), their sexual orientation, or their gender identity.

The majority of the participants were in their late 20's, although the participants' ages ranged from 23 to 41 years old (with a mean age of 29.25 years old). The participants' relationships varied in duration, with the shortest at 6 months, and the longest at 7 years, and the length of time since break up ranged from 2.5 months to 14 years. The participants were predominantly heterosexual, with only one bisexual participant taking part in the research.

Table 1 below shows a summary of each participants' demographic information and details about their relationship:

Participant	Gender	Relationship Duration	Time Since Break Up	Person that Ended the Relationship
Emma-25	Female	4.5 Years	1 Year, 9 Months	Ex-Partner
Christopher-28	Male	9 Months	14 Years	Mutual
Laura-28	Female	6 Months	11 Years	Ex-Partner
Nicola-28	Female	3 Years	5 Months	Mutual
Andrew-41	Male	3 Years	3 Years	Mutual
Claire-23	Female	9 Months	2.5 Months	Ex-Partner
Michelle-28	Female	7 Years	4 Years	Participant
John-33	Male	4 Years	3.5 Years	Participant

Table 1: Table outlining the demographics of participants in Study 1.

In order to contextualise the results of this study in section 5.3, I present a small introduction to each participant below:

Emma, 25

Emma-25 was in a relationship for four and a half years with a male partner; the pair met at university and lived together for the majority of their relationship, which did not end amicably. Emma-25's partner was an alcoholic, and his alcoholism put a heavy strain on their lives together; Emma-25 did not feel like she could end the relationship herself, and so ended it by cheating on her partner with another man. Emma-25 experienced harassment from her ex-partner despite her efforts to break the digital connection they shared. The relationship came to an end one year and nine months before the interview took place, and at the time of the interview, Emma-25 was in a new relationship.

Christopher, 28

Christopher-28 had been in an entirely digital relationship with a female partner who lived overseas. Although the two never met in real life, their relationship lasted for 9 months, coming to an end 14 years before the interview due to 'the unsustainability of this type of relationship'. This length of time since the relationship ended is the

longest of any participant in the study. Christopher-28 considered it to be his first real romantic relationship, despite it taking place virtually. At the time of the interview, Christopher-28 was married to another participant in the study, Laura-28.

Laura, 28

Laura-28 was in a relationship with a boyfriend during her final year in high school. Although at the time she thought of the relationship as her first real relationship, in hindsight she described it as 'simply young love'. Her relationship lasted for 6 months, coming to an end after her boyfriend broke up with her 11 years before the interview. At the time of the interview, Laura-28 was married to another participant in the study, Christopher-28.

Nicola, 28

Nicola-28 had been in a relationship for three years after meeting her boyfriend on Match.com. The relationship came to an end five months before Nicola-28 took part in an interview for this research. Although the majority of the relationship between Nicola-28 and her boyfriend was long-distance, the couple did live together for less than a year before breaking up. At the time of the interview, Nicola-28 was single, and cited '*different expectations*' around living together as the reason for her break up.

Andrew, 41

For three years, Andrew-41 was involved with a woman who had two teenage children from a previous relationship. Andrew-41 and his partner were both musicians, and a large part of their identity as a couple was connected to writing and playing music together. The pair mutually decided to break up with one another three years prior to the interview, as they were both worried about the effect their relationship was having on one of his partner's sons. At the time that the interview took place, Andrew-41 was in a new relationship.

Claire, 23

Claire-23 was in a relationship with a male partner for almost four years before they both entered into a polyamorous relationship with another couple, resulting in a four-way relationship consisting of two men and two women. The male partner from the second relationship left soon after the polyamorous relationship began, but the female partner stayed, resulting in a triadic polyamorous relationship between Claire-23, her male partner, and their female partner. After nine months as a triad,

Claire-23's female partner broke the romantic relationship off, although the three went to great efforts to maintain a platonic friendship. Claire-23 and her original partner remained together and at the time of the interview, were in an open relationship. The end of the triadic relationship occurred two and a half months before the interview took place, and is the shortest time since separation for any participant in this study.

Michelle, 28

Michelle-28 had been in a relationship that began towards the end of high school, and continued on into her adult life, spanning a total of seven years. Michelle-28 described the relationship as immature, stating that it 'never really developed past a teenage relationship'. The relationship came to an end three years prior to the interview taking place, as a result of Michelle-28's ex-partner's hidden gambling addiction which led to serious financial difficulties for the couple, and ultimately caused Michelle-28 to break it off. At the time of the interview, Michelle-28 was engaged to another participant in the study, John-33.

John, 33

John-33 had been in a relationship that lasted over four years. For three of those years, John-33 and his partner lived together, until their relationship came to an end as a result of his partner's infidelity. John-33 described the break up as being 'laborious and messy', as he was subjected to some harassment from his ex-partner after they broke up. The relationship ended three and a half years prior to the interview taking place. At the time of the interview, John-33 was engaged to another participant in the study, Michelle-28.

4.2.3 Analysis

Each participant interview was fully transcribed and analysed through thematic analysis as documented in Chapter 4 of this thesis. Also of note were any issues identified by participants when it came to owning or managing digital possessions as a result of their relationships ending. 35 initial thematic groups were created to house 3032 coded segments from the interviews. After iterating on these groups, the total number was reduced to 25, with similar groups combined and irrelevant data excluded. These groups contributed to the identification of five overarching themes, four of which were relevant for this research: *digital possessions that sustain relationships, comparing attitudes before and after break up, tainted digital possessions, and digital possessions and invasions of privacy*.

4.3 RESULTS

Table 2 below summarises the number of digital possessions the participants talked about in their interviews. The table highlights whether each participants' possessions were positively or negatively associated with the relationship after the break up, and whether or not that attitude changed from before the relationship came to an end. Where there was any change in attitude towards a digital possession, it was from a positive attitude pre-break up to a negative attitude post-break up.

Participant	Digital Possessions	Attitude Change?
Emma-25	7 Total; 4 Positives, 3 Negatives	3 Positives became Negatives
Christopher-28	4 Total; 3 Positives, 1 Negative	No Attitude Changes
Laura-28	4 Total; 3 Positives, 1 Negative	No Attitude Changes
Nicola-28	6 Total; 4 Positives, 2 Negatives	1 Positive became Negative
Andrew-41	2 Total; 1 Positive, 1 Negative	No Attitude Changes
Claire-23	6 Total; 3 Positives, 3 Negatives	3 Positives became Negatives
Michelle-28	2 Total; 2. Positives	No Attitude Changes
John-33	3 Total; 2 Positives, 1 Negative	2 Positives became Negatives

Table 2: Summary of the Digital Possessions discussed during the interviews with participants.

All participants shared more stories of digital possessions that they viewed more positively than they did digital possessions that they viewed negatively, except for Andrew-41, who told stories about one positive and one negative digital possession. The most common type of digital possession discussed across all eight participants was photographs, which were accessed across multiple mediums (on digital cameras, on computers, on phones, and on Facebook). Other types of digital possessions discussed during the sessions included chat histories (from Facebook Messenger, WhatsApp, MSN), Facebook posts, emails, videos, music, websites, location data, and login credentials.

4.3.1 DIGITAL POSSESSIONS THAT SUSTAIN RELATIONSHIPS

From the interviews with participants it became clear that communication technologies play a large role in sustaining connections between romantic partners

during a relationship. Nicola-28, mentioned that although she and her ex-partner had used Facebook Messenger to talk to one another during the long-distance portion of their relationship, she thought that they mainly communicated through phone calls and text messages. It was only upon reviewing her digital possessions during the interview that Nicola-28 realised just how frequently she used Facebook Messenger to communicate with her ex-partner:

> *"Older messages… 25, 514! Okay, so, a lot of the communication was obviously over Facebook."*

It was at this point in the interview that Nicola-28 realised for the first time just how many of the digital possessions from her relationship still existed despite the fact that her relationship with her ex-partner was a thing of the past. Had these messages instead been conversations that took place in a physical context, they would have passed by unrecorded; however, the digital remnants of the relationship persisted, and maintained a link between the ex-partners. Just because the relationship came to an end, that did not mean that the digital possessions associated with the relationship vanished at the same time:

> *"I think I've been thinking of it as 'Okay, it's finished, just move forward.' But obviously that stuff is all still there, and it's lurking around. If I wanted to, I could go back through the whole thing. I could read all 25,514 messages, you know?"*

When the idea of deleting these messages (or other digital possessions from the relationship) was raised, Nicola-28 explained that it was not an option that she was interested in pursuing:

> *"It's not that I prefer to keep them… I feel like deleting things is a very active, kind of negative thing. It happened, and sure it wasn't great all the time, but it wasn't bad all the time, and it's part of my history…"*

By deleting digital possessions connected to the relationship, Nicola-28 was concerned that she would be rewriting the history of that relationship. Further, she raised concerns that removing any public-facing digital possessions connected to her ex-partner would be misleading to future friends or partners that she connected to online:

> *"I don't want somebody to look at my Facebook photos and go 'Oh, you went to this country, that looked great, and you drove around' and all this kind of stuff, and then for me to have to say 'Yeah, it was great, it was with my ex-boyfriend', and then they'd be like 'Oh…'"*

The digital possessions that Nicola-28 and her ex-partner used to maintain their relationship and express their togetherness publicly when they were in a relationship served that same purpose even after their relationship came to an end – the connection existed through digital possessions that Nicola-28 was not even aware of. Andrew-41, experienced a similar connection to his ex-partner through his digital possessions, although unlike Nicola-28, he was actively engaging with his digital possessions.

Andrew-41 talked about a set of music files that were part of an album he and his ex-partner worked on together during their relationship. Andrew-41 co-wrote and co-performed a number of the songs on the album with his ex-partner, which Andrew-41 also produced. During the interview, Andrew-41 explained that the songs still held a lot of meaning to him, and that they kept him calm and relaxed in situations he found stressful:

> *"I'm not keen on flying, but I have to, to go to events for work. I kind of like that it makes me feel quite relaxed, listening to those songs."*

By keeping the music files on his phone, Andrew-41 was able to access them whenever or wherever he wanted; viewing them as a positive outcome of his relationship he actively sought out and interacted with these digital possessions in a way that was meaningful to him.

4.3.2 Comparing Attitudes Before and After Break Up

Whether or not the attitudes participants had towards their digital possessions changed as a result of a break up varied depending on the participant, their relationship, the break up, and the possession itself. The majority of the participants (n=6) talked about how their relationships coming to an end only reinforced their original attitudes towards particular digital possessions, and in some cases, elevated those attitudes to an even more positive level. Andrew-41 spoke about some of the music he and his ex-partner made together:

"I think the fact that I'm not with her now, when I listen to the music she wrote, it makes me think it's even more valued in a way."

In contrast to this, some participants (n=4) shared stories of digital possessions that adopted negative associations after a break up, despite being viewed positively during their relationships. Emma-25, explained that a photograph depicting her and her ex-partner at a graduation party had previously been one of her favourite photographs of the two of them together, but that since breaking up, she looked back on the image with a sense of regret. In hindsight, Emma-25 felt that the photograph documented the beginning of one of the largest contributing factors to the end of her relationship:

"It's tinged with the memory of… I don't know if you can tell, but in this photo he's quite drunk. It was just the start of him getting into heavy drinking, but obviously at the time I didn't know that."

Although there were no changes in the majority of the attitudes towards digital possessions discussed in the interviews, some possessions that had positive associations during the relationship were assigned negative connotations after the break up. However, the reverse of this was not true; none of the digital possessions that were negatively associated with the relationship acquired positive associations after a relationship break up occurred.

Despite all the participants owning digital possessions that they viewed as being negatively associated with their past relationship, less than half of the participants (n=3) reported deleting any negatively associated digital possessions. As was stated by Nicola-28 previously, there was some trepidation across participants around rewriting history or being seen to take negative action against a digital possession. However, there were cases where participants felt that they had to take action for their own benefit. Michelle-28 was a firm believer in deleting digital possessions, and in her interview she shared a simple outlook that she applied to the disposal of digital possessions, regardless of their connection to a past relationship:

"I would never keep a photograph that would remind me of a negative thing, the same way I would never keep a photograph that I thought made me look fat, or ugly - because I don't want to look at that. Why would I want to?"

This attitude was echoed by Emma-25, who had to deal with Google continually drawing her attention to digital possessions from her past relationship by listing them in results from her searches. Rather than face often quite negative reminders of her ex-partner, Emma-25 resolved the problem by simply deleting the digital content:

> *"I ended up deleting a lot because on Google, I would search and it would pop up with results from things like my chat history [with him], just because we had talked about something related. I just don't want to be seeing that!"*

4.3.3 Tainted Digital Possessions

This study approached attitudes towards participants' digital possessions as if they held a binary state; either a positive association, or a negative association. However, it became clear that some digital possessions went beyond being either simply positive or negative, and instead assumed a more conflicted association. Although more negative than positive, some digital possessions were considered to be 'tainted' by the participants; these possessions had value to the participants, but their connection to the past relationship was such that the participants would have preferred not to have them. The best example of this is in a set of digital photographs owned by John-33, which documented his and his ex-partner's travels through India. John-33 spoke of how important the trip was for him, of how much he learned and grew as a person during it, and of how frustrating it was for him that he felt like he could not share the evidence of that experience with his fiancé:

> *"I've always wanted to share my experiences travelling with Michelle, but because I went with my ex, I've never dared to go through the photos with her. I've never been able to share all these amazing things I saw, because they're so interspersed with pictures of my ex. The history is manifest in the fact that she's present in the photos - that whole section of my life and formative experience is something that I haven't shared because of my ex."*

A simple solution to this problem seemed to be that John-33 should delete any images that depicted his ex-partner from the collection, and keep the rest. When asked if this was something he would be interested in employing as a solution, John rejected the idea:

"It feels a bit silly to do that, in a way; to go through and delete the ones of her. So, I've just not gone back to it at all."

As tainted digital possessions seem to be more complicated to deal with post-break up than either entirely positive or entirely negative digital possessions, John-33 appears to have been unable to manage them in an effective way, resulting in his photographs being abandoned. Although the focus of this research was on digital possessions, it is likely that the concept of a possession being 'tainted' holds true in a physical context as well.

4.3.4 Digital Possessions and Invasions of Privacy

When discussing digital possessions that were negatively associated with past relationships, half of the participants shared stories about digital possessions connected to experiences of harassment and invasions of privacy. These digital possessions were all considered to be positive during the relationships, but all became negative post-break up. Claire-23, experienced this in a unique way, in that simply by owning certain digital possessions after her relationship ended, she felt that she was invading the privacy of her ex-partner.

While in a triadic relationship with a male and female partner, Claire-23 (a hobbyist photographer) had taken sexual photographs of her then-girlfriend, and these files were shared between all three partners. After her girlfriend broke things off and withdrew from the relationship, Claire-23 found it difficult to determine the responsibility she had towards the images:

"I feel quite awkward, because there isn't going to be a sexual element to the relationship anymore, and with these photographs, it kind of feels like I'm maintaining some part of the sexual relationship."

Although the digital possessions were in Claire-23's possession during the relationship, she felt that, by keeping them, she was invading the privacy of her ex-partner. This presents a question of ownership of the digital medium; as the photographer, does Claire-23 own the photographs, or as the subject of the images, does ownership fall to Claire-23's ex-girlfriend (particularly because of their sexual nature)?

Emma-25, on the other hand, experienced an invasion of her own privacy when her ex-partner began to misuse her location data after they broke up. During their

relationship, Emma-25 and her partner shared their Google location data with one another to make their day-to-day lives easier; rather than texting each other to ask, for example, when they would be coming home, in order to know when to start cooking dinner, they could simply check the other person's location. After the tumultuous end of her relationship, Emma-25 forgot to remove her ex-partner's access to her location data, and was surprised when he began to contact her with knowledge of her whereabouts. This came to a head when her ex-partner tracked her to a male friend's house, and sent her threatening messages via Facebook Messenger:

> *"I got hundreds of messages that night. Things like 'I see you're over at [friend]'s house tonight?', 'You'd better find somewhere else to park your car', and 'I hate you, if I ever see you again I'll put your head through a wall'.*

Emma-25 estimated that it was three months after their break up before she realised that he was still able to access her location, and revoked his access to it.

4.3.5 Summary of Results

The introduction of technology into a romantic relationship can make disconnecting from ex-partners difficult. The various ways in which technology supports and encourages connections between individuals can be subverted and used to force connections that may not be wanted. By engaging in a romantic relationship in a digital context, individuals are constantly generating digital possessions, sometimes without even realising they are doing so. These possessions serve to positively entangle digital presences when partners are together but can cause issues for the individuals post-break up.

Participants regarded their digital possessions positively or negatively. These attitudes were based on the individual's feelings towards the possession, their ex-partner, the nature of their relationship and the nature of their break up. Some participants experienced a shift in their attitudes towards their digital possessions after a break up, and when this was the case, those attitudes consistently shifted from positive to negative. Some digital possessions were caught in an in-between state and marked as 'tainted' due to the influence of an ex-partner on, or the depiction of an ex-partner in, those digital possessions.

4.4 Discussion

The results from this study go towards developing an understanding of the ways in which an individual's perspective on their digital possessions changes after a break up. Below, I outline three opportunities for design that have resulted from my analysis, as well as potential research avenues based on my findings. I name these opportunities for design: encouraging awareness of digital possessions; managing digital possessions and attitudes towards them post-break up; and disconnecting and reconnecting.

4.4.1 Encouraging Awareness of digital Possessions

When partners enact some of their relationship in a digital context, they generate digital possessions pertaining to that relationship. During the interview process, participants rediscovered digital possessions from their past relationships that they did not realise they still had or had access to. One participant, Nicola-28, severely underestimated the extent to which she and her then-partner had engaged in conversation via Facebook chat. This suggests that although messaging was the most frequent method of communication between the couple, it was considered to be more of a background activity than a prime method of communication, mirroring mundane conversation that regularly takes place offline in daily life (Alberts et al., 2005). It may have been used regularly to sustain the relationship, while phone calls, initially cited as the most used form of communication between the two, were *less* frequent and, therefore, potentially *more* memorable. The rediscovery of these digital possessions, for Nicola-28 in particular, was somewhat overwhelming.

By taking an overview of the content they have, individuals may be able to make higher level choices concerning curation without having to revisit each digital possession in their collection. Increasing awareness of possessions from during and after a relationship may empower individuals such as Nicola-28 to manually curate their digital possessions more effectively. Increased familiarity with digital possessions could lead to easier curation or disposal after a break up, as well as (optimistically) encouraging proactive curation as a regular task.

There is also an opportunity here for designers to explore how to filter collections of digital possessions in a more nuanced manner than is currently available; for example, through a set of inclusion or exclusion criteria that persists through multiple searches, until the user chooses to remove or refine it. An example of this

could be to filter a collection of digital possessions by time period, where only digital possessions that exist within a specific date range are visible to an individual.

4.4.2 Managing Digital Possessions (and Attitudes Towards Them) Post-Break Up

In terms of the broader goal of this thesis (to investigate the ways in which technology can help individuals to manage their digital possessions in order to support them in moving on) a particularly relevant finding from this study was that participants reported engaging in non-action with regards to their digital possessions in certain circumstances. Some participants talked about digital possessions that caused them emotional pain, or affected their subsequent relationships in some way, but when asked if they would consider deleting those possessions as a solution to the problem, they rejected the idea.

While some participants were willing to delete any digital possessions they no longer wanted to see, others had concerns that their actions could be construed as silly or seen as efforts to 'rewrite history'. This suggests that some people do not fall into the curation roles laid out by Sas and Whitaker (Sas & Whittaker, 2013), and instead adopt an additional role of 'Abandoner'; individuals who neither keep nor delete digital possessions, but instead purposefully take no action and make no decision as to curating certain possessions.

Participants may find acting on digital possessions in the context of a break up difficult because they are not directly supported in curation beyond typical save, edit, or delete grammars of action. The idea that the typical actions and interactions an individual can carry out on a file are contextually limited has been discussed in Chapter 2 of this thesis (Harper et al., 2013); the experiences of these participants hint at the need for new ways to curate and manage digital possessions, highlighting relationship break ups as one context that suffers from limited grammars of action as called out by Harper et al.

The attitudes individuals have towards specific digital possessions can and do change as a result of a break up. I have seen in my participants that these changes are dependent on the individual digital possession in question and are driven by the individual's experiences of their past relationship, their break up, their interactions with their ex-partner after the break up, and potentially their experiences in new romantic relationships as well.

Some digital possessions transitioned from being viewed positively to negatively post-break up, some even becoming 'tainted' due to conflicting positive and negative attitudes. For example, John-33, whose ex-partner was overtly linked to and depicted in his photographs of an otherwise extremely positive time of self-growth. Even though these digital possessions were grounded in a highly positive experience for John-33 (his travels through India), they became tainted with negativity due to his poor break up experience and the decline of his interactions with his ex-partner as she began to harass him. Although past research highlights the ways in which digital possessions can be imbued with meaning (Kirk & Sellen, 2010; Massimi et al., 2011; Odom et al., 2011), they discuss meaning only from a positive perspective; this study extends this prior work by documenting examples of digital possessions that are imbued with negative meaning.

There may be an opportunity to use technology to support individuals like John-33 in reclaiming important or meaningful digital possessions after a break up by designing interactions that allow individuals to reframe those digital possessions. This could be achieved by changing the content a digital possession depicts, or by changing the context in which a digital possession is viewed or stored. Creating methods of editing tainted digital possessions in order to remove the negative parts that conflict with an otherwise positive attitude towards them might be a way of achieving this.

4.4.3 Disconnecting and Reconnecting

Disconnecting from an ex-partner in a digital context is incredibly difficult as a result of interwoven digital presences and the ways in which digital possessions forge a connection between ex-partners (Moncur et al., 2016). Information such as current location data or login credentials, which were useful to share between partners during a relationship, suddenly become invasions of privacy after that relationship has come to an end. Individuals do not typically keep a record of what accounts or information they have given access to their partner, and as was seen in the case of Emma-25, unauthorised access by a malevolent ex-partner can cause serious digital and real-world issues.

There is an opportunity here to empower individuals to remove a partner's access to their digital possessions upon a relationship break up through automation. A simple solution may be to track the devices that access an individual's personal accounts and sensitive information (similar to a Google account's list of recently used

devices) and link that tracking system to an individual's relationship status. Upon ending the relationship and changing their status, the individual could receive an automated message requesting approval for devices on the list. Any devices not granted approval could be blocked from accessing accounts, even if they have the correct login credentials.

The level of contact an individual wants to maintain with an ex-partner may change over time, and the capability to change and fine-tune that connection could be useful as perspectives change. Not all relationships will necessarily come to an unpleasant end, and it is important to consider how perspectives towards past relationships can change over time. Laura was initially very distraught when her partner ended their relationship, but as time passed and she moved on, she saw benefits to having her ex-partner as a friend on Facebook:

> *"Yeah, probably Facebook's been quite good… I think he has a girlfriend now, so it's quite nice to see that he's moved on and is quite happy and stuff, so."*

This presents an opportunity for various degrees of disconnection to be made available to individuals on SNS; in some cases, individuals may not want an active connection with an ex-partner, whereas in others they may only want to see important status updates (such as Facebook's Life Events).

Prior work has concluded that an individual changing their relationship status on Facebook is a common step among SNS users in publicising the end of a relationship (Moncur et al., 2016); it can be seen as a very visible attempt to disconnect from an ex-partner. In the break up of Claire-23's polyamorous relationship explored in this study, the participant touched upon the lack of support for her non-traditional relationship type on SNS, specifically citing Facebook's restrictive relationship status feature. Unable to have more than one partner listed on her status at one time while in the triadic relationship, Claire was then unable to change her status to reflect her transition to a dyadic relationship; as far as Facebook was concerned, Claire-23 and her ex-partner were continuing the same relationship they had previously shared.

Facebook had previously expanded the gender categories it provided from 3 options (male, female or private) to 58 (Goldman, 2014), but now allows individuals to define their own gender identity (*Custom Gender Announcement - Facebook*

Diversity, 2015). A natural progression may be for Facebook to include a similar, expanded list of relationship status options, or to let users define their own relationship type. In the case of Claire-23, she might be able to set multiple people as partners in her relationship status, defining her relationship on her own terms. With this more inclusive approach, Facebook could support individuals in any relationship type in giving them the opportunity to disconnect from an ex-partner through relationship status updates.

4.5 Conclusion

This chapter answers the first of the three research questions of this thesis: How does an individual's perspective on their digital possessions change after a relationship break up? By exploring the attitudes individuals have towards digital possessions from a past relationship, and how those attitudes are affected by that relationship ending, I report my insights on individuals' changing perspectives as a result of relationships coming to an end. By analysing data from a set of eight semi-structured interviews, I explored themes of digital possessions that sustain relationships, comparing attitudes before and after break up, tainted digital possessions, and digital possessions and invasions of privacy, and identified opportunities for design in three different areas.

The themes discussed in this chapter demonstrate that digital possessions persist after a break up, and that that persistence creates a connection between ex-partners. Whether that connection is seen as being positive or negative is unique to each individual, the digital possession in question, and the circumstances of their relationship and break up.

By acknowledging that digital possessions connect individuals after a break up, I identified an opportunity to support individuals in managing that connection through the curation of those digital possessions. The next step in this research is to explore the ways in which individuals currently use their digital possessions after a relationship ends. By understanding how different types of digital possessions are used after a break up, the tech community can design for managing those digital possessions (and therefore managing that connection) around those contexts of use.

In the next chapter I report on research that explores the ways in which technology may be used to support ex-partners in managing this connection as a means to disconnect or reconnect with one another.

CHAPTER 5.
DIGITALLY DECOUPLING AND DISENTANGLING POST-BREAK UP

CHAPTER SUMMARY

In the previous chapter, I explore attitudes individuals have towards digital possessions from a past relationship, with conclusions drawn around opportunities for design. In this chapter, I report on 13 semi-structured interviews with the aim of understanding the ways in which individuals interact with their digital possessions in a post-break up context. By understanding the ways in which individuals interact with their digital possessions after a break up, I aimed to determine how technology could support the management of those digital possessions and contribute to disentangling from an ex-partner.

The data gathered from the interviews was transcribed and analysed using Affinity Diagramming, resulting in four themes: Communication and Avoidance; The Role of Digital Possessions; Managing Digital Possessions; Experiences of Technology. These themes served as the basis for guidelines focused on designing systems to support disconnecting: Decoupling and Disentangling; Managing Limited Connections; and Taking Action Through Interaction.

This chapter is based on the following publication:

Herron D., Moncur W., van den Hoven E. (2017). *Digital Decoupling and Disentangling: Towards Design for Romantic Break Up*. In Proceedings of Designing Interactive Systems. Edinburgh, Scotland. DIS '17.

5.1 Introduction

Moving forward from the research documented in the previous chapter I investigate the idea that digital possessions serve to connect partners even after the end of a romantic relationship. As discussed in Chapter 2, digital possessions play a role in the development of an individual's digital identity; similarly, I believe that digital possessions created and shared by partners in a romantic relationship serve to build an identity of togetherness for those partners, which continue to exist, and persist, after a relationship break up. To that end, the aim of the research documented in this chapter was to inform the design of systems focused on supporting individuals to decouple and disentangle digitally through the management of their digital possessions. To do this, I explored the ways in which individuals interacted with their digital possessions in a post-break up context.

5.2 Study Setup

5.2.1 Procedure

As with the first study, semi-structured interviews were carried out on a one-to-one basis with participants and took place in the participants' homes whenever possible. Three out of thirteen participants could not conduct interviews at home; Ava-34 and Ethan-24's interviews took place at the university as they both lived with their partners, and neither felt that they would have sufficient privacy at home to discuss their past relationship. Noah-52's interview took place at his rental home rather than his family home, as he was living separately during his divorce proceedings. These three participants were still able to access their digital possessions during their interviews through laptops, phones, and tablets.

The interviews were comprised of three parts, and the full interview guide for this study can be found in Appendix C. Firstly, the participants were asked to share the story of their relationships. These contextual questions were open-ended, for example, '*What was the relationship like?*', and were targeted at finding out how the participant and their ex-partner met, how long their relationship lasted, whether the participant considered it to be a serious relationship, and how and why they broke up.

The second part of the interview was the main focus of the sessions and involved gathering stories surrounding several different types of meaningful digital possessions pertaining to the past relationship. Each participant was given a (non-

exhaustive) list of types of digital possessions to prompt them to think of stories. The list included digital photographs or digital photo albums, social media posts, video clips, chat histories, audio files, emails, accounts that they shared ownership of, accounts that they shared the use of, text messages, and other. For each meaningful digital possession that the participants identified, they were asked:

- What is the story behind this digital possession?
- How did the way you use or interact with the possession change when the relationship ended?

The third and final part of the sessions focused on how much interaction the participants had with the digital possessions they discussed since their break ups, as well as whether or not the participant felt they had the means to deal with the digital possessions through currently available technologies. The participants were asked:

- Since the break up, have you purposefully looked at or accessed the digital possessions we discussed before today?
- When you broke up with your ex-partner, did you feel that you had the means to deal with your digital possessions from the relationship?

The mean interview time was one hour and seven minutes (the shortest interview was 48 minutes, and the longest was one hour and 34 minutes). As with the interviews from the research documented in Chapter 4, some interviews took longer than others simply because some participants had more digital possessions to discuss than others. Each participant was given a £5 Amazon voucher at the end of the interview to compensate them for their time.

Due to the personal and sensitive nature of the interviews, protocols were put in place to minimise the risk to any participants; I watched for signs of distress from participants during the interviews, offered breaks when necessary, and stressed that the participants were free to take breaks of their own accord or stop the interview at any time. Details for free phone counselling services were brought to the interview sessions in case the participant wanted to talk to a professional about their experiences, although no participants requested additional support.

5.2.2 PARTICIPANTS

As with the previous study, there were no exclusion criteria beyond that participants (a) were over the age of 18, (b) had experienced a relationship break up, and (c) that the participants actively used digital technologies and/or social media during the relationship. Participants of all sexual orientations, gender identities, and relationship types were welcome to take part in the study. 13 participants volunteered to take part in the research and were recruited primarily from posters advertising the study in shopping centres, cafes, restaurants, sports clubs, grocery stores, and university buildings. The majority of the participants were female (n=10) and heterosexual (n=12), with one homosexual participant.

The participants were mostly in their early 20's, with two participants in their early 30's and one 52-year-old participant (the mean age was 25.39 years old). The participants' relationship durations ranged from 10 months to 29 years, and the time since break up ranged from four months to four years ago. Table 3 below shows a summary of each participant's demographic information and details about their relationship:

Participant	**Gender**	**Relationship Duration**	**Time Since Break Up**	**Person that Ended the Relationship**
Emma-25	Female	4.5 Years	2 Years	Ex-Partner
Caterina-18	Female	10 Months	8 Months	Mutual
Baozhai-21	Female	2.5 Years	4 Months	Participant
Olivia-19	Female	3.5 Years	1 Year, 3 Months	Mutual
Ava-34	Female	14 Years	5 Months	Participant
Wilson-22	Male	4 Years	1 Year	Participant
Bella-20	Female	1 Year, 2 Months	1 Year, 5 Months	Participant
Noah-52	Male	29 Years	8 Months	Participant
Mia-20	Female	4 Years	6 Months	Participant
Zoe-33	Female	8.5 Years	3 Years	Participant
Deborah-19	Female	2 Years	10 Months	Ex-Partner
Emily-23	Female	5 Years	4 Years	Participant

Ethan-24	Male	4 Years	1.5 Years	Mutual

Table 3: Table outlining the demographics of participants in Study 2.

In order to give additional context for the results from this study, some background information about each participant and their break up is given below:

Emma, 25

Emma-25 was in a relationship for four and a half years with a male partner; the pair met at university and lived together for the majority of their relationship. The relationship did not end amiably. Emma-25's partner was an alcoholic, and his alcoholism put a heavy strain on their partnership. Emma-25 did not feel like she could end the relationship herself, and so ended it by cheating on her partner with another man. Emma-25 experienced harassment from her ex-partner despite her efforts to break the digital connection they shared. The relationship came to an end just over two years before the interview took place, and at the time of the interview, Emma-25 was in a new relationship. Emma-25 was the one that initiated the break up. She also took part in the study documented in the previous chapter.

Caterina, 18

Caterina-18 and her boyfriend had been together for 10 months before breaking up. Caterina-18 had to move to a different city to attend university, and the couple decided that a long-distance relationship would be too difficult. Caterina-18 and her boyfriend made the decision to end their relationship mutually and were still on good terms with one another at the time of the interview; they remained in contact both in person and digitally. The relationship came to an end eight months prior to the interview.

Baozhai, 21

Baozhai-21 and her boyfriend were together for two and a half years before they broke up; Baozhai-21 described their relationship as being 'between serious and committed dating'. The final six months of the relationship was long-distance as Baozhai-21 moved from China to the UK. While in the UK, Baozhai-21 discovered that her boyfriend had been seeing another woman, which led to her ending the relationship. The relationship came to an end four months before the interview.

Olivia, 19

Olivia-19 and her partner moved to separate parts of the UK to attend different universities and found the long-distance aspect of their relationship challenging. The

pair were together for three and a half years, before their relationship came to an end as a result of Olivia-19 cheating on her partner. Although they stayed together for a while after Olivia-19's infidelity, both she and her boyfriend ultimately decided to end the relationship one year and three months before the interview took place.

Ava, 34

Ava-34 and her fiancé were together for a total of 14 years. Ava moved to the UK for work, with the intention that her partner would finish off his job at home before moving to join her. While in the UK alone, Ava-34 fell in love with another man. She and her fiancé broke off their engagement but stayed together for a time, before subsequently ending their romantic relationship. Although Ava-34 is currently with the man she fell in love with in the UK, she and her ex-partner remain close, and maintain regular contact over social media and video chat, as well as in person. Ava-34 ended her relationship five months before the interview took place.

Wilson, 22

Wilson-22 moved to another country to attend university, citing a year of long-distance as the main reason for the end of his four-year long relationship. Wilson-22 and his girlfriend travelled to see each other frequently during their year apart, and used social media and video chat to stay in touch with one another. However, Wilson-22 felt that both he and his girlfriend were struggling as they tried to maintain their relationship. Although he did not want to break up with his girlfriend, he said that he knew it was 'the right thing to do' and ended the relationship one year prior to the interview.

Bella, 20

Bella-20 was the only homosexual individual to take part in this study. She and her partner had been together for a year and two months before breaking up. Bella-20 cited a number of factors that contributed to the end of their relationship. The two most major contributions to her break up, according to Bella-20, were that she was dealing with depression, and that her partner decided to transition from female to male. The two were close friends before they became romantically involved and remained close despite their break up. Bella-20 took pride in the fact that she and her ex-partner still supported one another through difficult experiences even after their romantic relationship ended. The pair broke up one year and five months before the interview took place.

Noah, 52

Noah-52 was this study's oldest participant, and at the time of the interview, was living separately to his wife and children while his divorce was being finalised; he and his ex-wife had three children together. A misdiagnosis of terminal cancer led Noah-52 to re-evaluate and then end his marriage. Before his misdiagnosis was corrected, Noah-52 felt his wife was more concerned with collecting their shared assets in her name than supporting him emotionally, and after the misdiagnosis was corrected, Noah-52 decided to end his marriage. Noah-52's separation from his wife had been difficult, as she falsely accused him of domestic abuse after he began the divorce process, which led to court hearings to prove his innocence. Noah-52 had a hard drive that held copies of all his digital possessions, taken from the computer in his family home. Noah-52's relationship ended eight months prior to the interview for this study.

Mia, 20

Mia-20 was in a relationship that transitioned to long-distance in its last four months. Mia-20 and her boyfriend had been together for four years, and although they were relatively young when they began dating, they dealt with serious issues as a couple; Mia-20's boyfriend was diagnosed with cancer while they were together, and she was with him during his subsequent treatment and into his recovery. Mia-20 moved to the UK for university, but felt that she couldn't cope with the long-distance, and decided to end the relationship via Skype six months before taking part in this research.

Zoe, 33

Zoe-33 was in a long-term relationship with her partner for eight and a half years. The pair broke up briefly during their relationship before getting back together, but it was not meant to be; they broke up for a second and final time after Zoe-33 decided that she had 'just had enough', citing issues of unequal responsibilities in the relationship. Zoe-33's relationship ended three years prior to the interview for this research, during which time she had become engaged to her new partner.

Deborah, 19

Deborah-19 met her boyfriend while gaming online. The pair happened to be from the same town, and after developing a friendship, began dating. Their relationship lasted two years. Their relationship came to an end for a number of reasons, but Deborah-19 cited his boyfriend's mother as being the main cause of their break up,

as she did not approve of the relationship. Deborah-19 felt that cultural differences were the underlying issue and was frustrated that their relationship ended in this way. The pair broke up 10 months before the interview took place.

Emily, 23

Emily-23 became engaged to her partner at the age of 18. The couple planned their engagement to last throughout their university courses, after which they would get married. Emily-23 was accepted into a university away from her home town, and moved to attend, while her fiancé did not get accepted to any institutions, putting a strain on their relationship. Emily-23's attempts to maintain contact with her partner via texts, calls, chats, and even in person were rebuffed by her fiancé, who eventually refused to even see her. Emily-23 later decided that the relationship was over and 'officially' ended it by cheating on her partner. The relationship lasted for five years and came to an end four years prior to the interview.

Ethan, 24

Ethan-24 had been with his partner for four years, the pair living together during part of their relationship. They were both offered employment and education in different cities, and after lengthy discussion, mutually decided to end the relationship. Although they intended to remain friends, Ethan shared that they had not spoken since shortly after their break up, 18 months prior to taking part in this research. Subsequently, Ethan-24 had entered into and ended another relationship, and at the time of the interview, was single.

5.2.3 Analysis

Each interview was fully transcribed and analysed through the construction of an affinity diagram. 470 affinity notes were created from across all 13 transcripts; these were printed on to individual slips of paper and randomly split into two equal sets of data. The first set of data was given to a team of five researchers to be analysed, as seen in Figure 2.

Figure 2: The team of five researchers as they began the affinity diagramming process.

This team of researchers were given 235 affinity notes and were told to begin creating groups based on the content of the affinity notes; similar notes were to be grouped together. The team arranged their affinity notes into 71 initial groups, which they iterated on twice to merge similar groups, discard irrelevant groups, and separate out groups that had grown large enough to span multiple themes. After these researchers decided that they were satisfied with their affinity diagram, I then took the second set of data and organised it using the affinity diagram structure that the first data set had been sorted into, keeping to that initial structure as much as possible.

After sorting the second data set and iterating on the structure a final time, seven affinity groups made up the final affinity diagram. This resulted in contextual insights in four areas across the participants' accounts: communication and avoidance; the role of digital possessions; managing digital possessions; and experiences of technology. These themes are explored in detail below.

5.3 Results

Due to its prevalence in the data, it should be noted that no particular emphasis was placed on Facebook content during the interviews; participants simply tended to focus strongly on Facebook as it was the dominant tool they used to communicate with their ex-partners and create and share their digital possessions.

5.3.1 Communication and Avoidance

Every participant spoke about their experiences with communication technologies; digital possessions and communication mediums such as chat histories, text messages, and messaging services featured prominently in the participants' stories, as did the content of their social media profiles and posts. The connectedness that communication technologies brought to ex-partners was not always welcome; Ava-34, recounted her experience of spending time with a man that she was falling in love with while living separately from her then-fiancé, but was constantly reminded of the fact that she was being unfaithful due to the messages from her fiancé that she was leaving unopened on her phone:

> *"There were moments where I just didn't answer for days because I was with someone else. I could hardly be there and text him at the same time. I let my battery run down, and then I just wouldn't have that connection anymore."*

This *avoidance* was often seen as a response to feeling guilty over the end of a relationship with an ex-partner. Emily-23, and Zoe-33, both spoke of how they were very careful after their break ups to monitor what they were posting publicly on social media. Both participants stayed connected to their ex-partners online after ending their relationships, but wanted to avoid engaging with them, and to ensure they did not draw too much attention to their post-relationship lives. Emily-23 said:

> *"I didn't tweet, or Facebook, or anything, because again, you don't want to rub it in."*

Zoe-33, who had entered into a new relationship soon after breaking up with her ex-boyfriend, was wary of posting anything on social media connected to her new relationship, as she was afraid of hurting her ex-partner. She and her new boyfriend did not even set a public relationship status on Facebook until Zoe-33 felt that her ex-boyfriend had moved on. Zoe-33's ex-boyfriend initially struggled to deal with their break up, although, ironically, after he embarked on a new relationship, he did not share her caution when it came to carefully curating what he shared about his new relationship. Zoe-33 commented:

> *"I was really annoyed because they got to have a fresh start, in general, in life. When I started going out with my new boyfriend, I was still dealing*

with the aftermath of our old relationship, still receiving his constant abuse. It wasn't fair, I felt."

Beyond the participants reporting instances where they did not communicate with their ex-partners, some participants (n=4) spoke of their experiences of *being avoided* by their ex-partners. Emily-23's ex-fiancé cut off contact with her for approximately a year after they ended their relationship, refusing to speak to her and ignoring her efforts to stay in touch:

"I couldn't tell where he was, mentally. It felt like I didn't know him anymore; it'd been a year that we'd been apart, and he wasn't a part of that year."

Perhaps only as a result of Emily-23's continued attempts to maintain a connection to her ex-partner through communication technologies, he did eventually break his silence with her to talk about their relationship ending. Emily-23 shared some of their chat history during the session, while discussing a Facebook message where her ex-fiancé thanked her for ending their engagement:

"He had sent me a message saying that he wanted to thank me for breaking up with him, and for having the courage to do it, because we both knew it wasn't working, but he wasn't brave enough to take that step."

Communication services were the primary medium through which some participants (n=2) *experienced abusive behaviour* from their ex-partners. Emma-25 recalled that her ex-partner used a variety of mediums to force contact with her. These included spamming Emma-25 with text messages and messages on Google Hangout and Facebook Messenger, and repeatedly calling her phone (on one occasion, over 20 times in one day). Emma-25's ex-partner was able to use the tools that the couple had used to sustain their relationship pre-break up to force a connection and harass her after their break up, as can be seen in Figure 3 below. In the three screenshots in Figure 3, Emma-25 can only be seen sending messages in the right-hand image (the text in the blue chat bubbles). All other messages were sent by Emma-25's ex-partner:

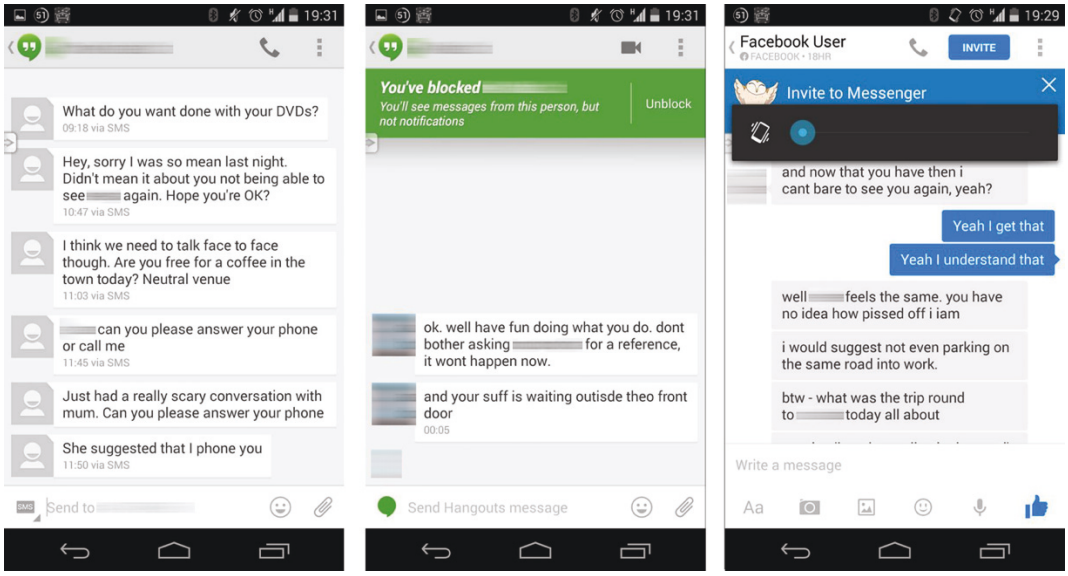

Figure 3:Left to right, screenshots of a text message thread, a Google Hangout chat, and a Facebook Messenger chat with Sophia's ex-partner.

Similarly, Zoe-33 discussed her ex-partner's evolving context of use with regards to the messaging app WhatsApp. Before they broke up, Zoe-33 said she would have been lucky to receive replies to messages she sent to her ex-boyfriend, but after their relationship ended:

> *"He realised that WhatsApp was kind of a tool, where you could get in touch with someone and always get them. I felt really attacked."*

Despite feeling that she was being attacked by her ex-partner in his attempts to make contact over WhatsApp, along with Olivia-19, and Emily-23, Zoe-33 was one of three participants that spoke of visiting their ex-partner's Facebook pages to check up on them after their relationships had ended:

> *"I'm friends with him on Facebook, but I don't have him as an active feed. It's to check that he's okay, because breaking up was so bloody awful. I was checking, and I was happy, because I remember thinking, 'you've done the right thing for both of you [by ending it]'."*

Contrary to the literature discussed previously, these three participants were not carrying out surveillance on their ex-partners to feel connected to them; having instigated the ends of their relationships, *feelings of guilt* were common across Emily-23, Olivia-19, and Zoe-33. The three used Facebook as a tool to keep tabs on their ex-partners' wellbeing and as a way of giving themselves peace of mind. Emily-23 commented:

"I've definitely gone on his page every now and then just to see if he's okay. It's because I cheated on him, I feel a bit guilty, and I felt like I'd ruined him…"

5.3.2 The Role of Digital Possessions

After relationships came to an end, the role of participants' digital possessions often shifted. Across several participants (n=3), their digital possessions *took on the role of evidence*, and were used as proof of their ex-partners' actions across a variety of audiences, with increasing degrees of seriousness. Zoe-33 and Emma-25 both spoke about saving texts or screenshots of call logs to show friends the kinds of abusive behaviours they were being subjected to. Zoe-33 said:

"At the time, I was storing texts to show people – to go, what am I dealing with?! This is why I split up with him! It was about having that evidence."

Emma-25 went a step further, taking screenshots of the messages she was receiving from her ex-partner. The screenshots in Figure 3 (in the previous section) are examples of the types of messages she was receiving, although they do not include the most aggressive messages Emma-25 had been sent. Whereas Zoe-33 was using the messages as evidence for her friends, Emma-25 decided to use the screenshots of her messages in a legal capacity, showing them to a lawyer whom she asked for advice. Emma-25 was advised to take the digital possessions to the police, and was subsequently granted a no-contact order against her ex-partner.

After pursuing a divorce from his wife, Noah-52, was concerned with keeping the digital possessions from his relationship, as well as any future digital possessions connecting him to his ex-wife. Having had to prove his innocence in court after being falsely accused of domestic abuse by his ex-wife, Noah-52 was very aware of how important it was that he keep records of digital contact between himself and his ex-wife:

"The only things that I've kept now, that I wouldn't have kept before, are evidential. I want to have them so I can produce them in court, or in evidence, if I need to."

As participants shared stories of meaningful digital possessions from their past relationships, it became apparent that a role across all of the digital possessions discussed was that of an external memory cue (van den Hoven & Eggen, 2014).

Negative memories were cued and shared across every interview; Emily-23 reminisced about her ex-partner's marriage proposal when discussing a photo that was taken after they became engaged:

> *"I feel sick, nauseous, looking at the picture right now. I think I knew at the time that it wasn't going to work out, and it wasn't right, but you can't say no to someone when they're sitting in a fucking gondola with you, with a ring in their hand!"*

Unfortunately, Emily-23's good humour as she looked back on her relationship was not common across participants as they reminisced; many *remembered struggling with their relationships ending* or dealing with the difficult aftermath of their break ups. During her relationship, Bella-20, was given a birthday gift by her then-girlfriend – a hand-drawn digital comic book depicting the story of how they met, which can

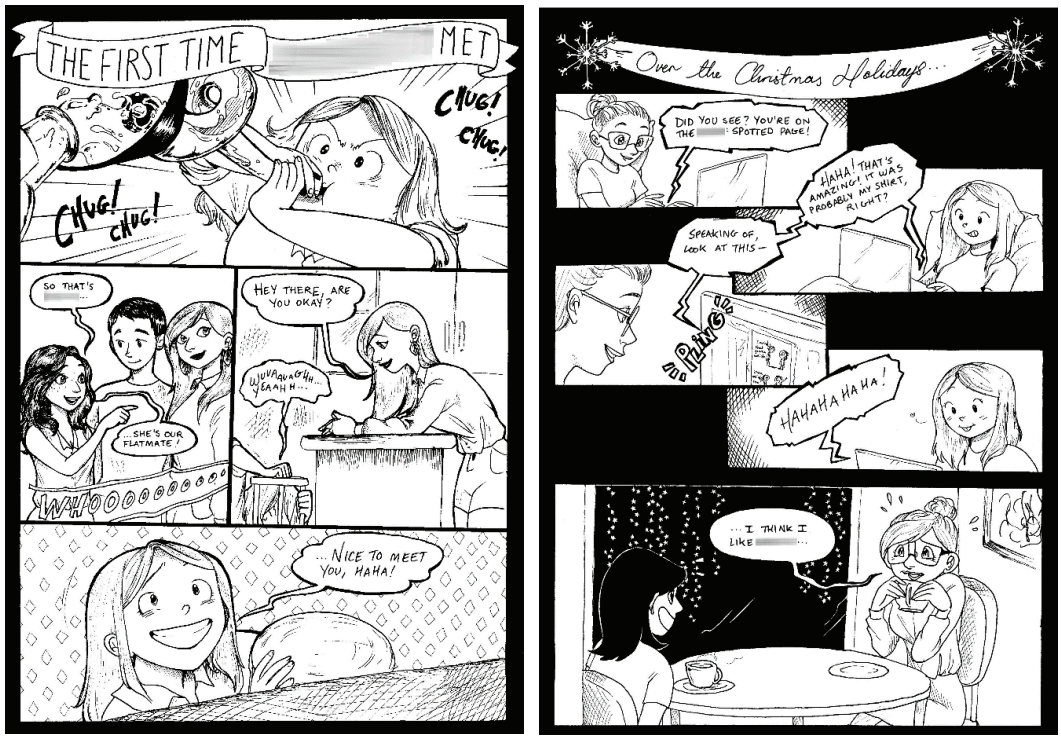

Figure 4: The first and second pages of a personalised digital comic gifted to Bella by her girlfriend as a birthday present.

be seen in Figure 4.

While looking at the comic book during the session, Bella-20 spoke of her experiences encountering the image files after she and her ex-girlfriend broke up, specifically discussing why she avoided looking at the digitised comic in the time just after her relationship came to an end:

"For a long time, I was just really sad that it didn't work out between us, and the comic just made me kind of miss us being together."

Memories of the relationship were made manifest in this digital possession, and Bella-20 was not prepared to encounter either the possession and what it depicted, or the feelings of longing that it brought up for her.

As with taking on the role of memory cues to prompt reminiscing, the meaningful digital possessions participants interacted with during the interviews often caused the participants to reflect on their past relationships. Where *reminiscence* is more 'backward looking', *reflection* is a much more constructive activity (Burns & Bulman, 2000; Pennebaker, 1997) that involves analysis beyond simply remembering (Staudinger, 2001). Wilson-22, reflected on his decision to end his relationship as he shared the story of a photograph of himself and his ex-girlfriend. An issue for Wilson-22 was that he wasn't sure how to act around his ex-partner after their break up, and this photograph prompted questions around their future platonic relationship:

"It feels different; you know this person was meaningful to you, but you're not sure how meaningful they are anymore, because you don't know if you will get to be with that person anymore or interact with them in any way. So you're looking at the picture and you're like… 'That person used to go to the same places I go'."

While exploring their digital possessions, four participants engaged in *bittersweet reflection*, where their digital possessions evoked both positive and negative feelings. These digital possessions are reminiscent of the tainted digital possessions discussed in the previous chapter, but where the tainted digital possessions were considered to be more negative than positive, and so were often abandoned or excluded from collections, the digital possessions that evoked bittersweet reflections appeared to be deemed worthy of keeping - they had a purpose. At the end of her interview, Caterina-18 discussed the complicated relationship she has with the digital possessions:

"It was a happy relationship, so looking at the digital possessions is good and bad. It makes me sad because I do miss the relationship, but at the same time, I know breaking up was the right thing to do. These remind me of the good times we had, and that's a happy thing."

Similarly, Noah-52 considered his decision to end his relationship while scrolling through all of his digital possessions, again exploring this bittersweet reflection:

> *"I've made the right decision. I'm not going back. And, the images that are in there, when I'm comfortable with them again, they'll be used to try and reconnect, to show me that the relationship wasn't all counterfeit. It was flawed, it was difficult, but good things are worth fighting for."*

At the end of her interview, Ava-34 reflected on how she had tried to rationalise her break up when ending her relationship with her ex-fiancé; how she had constructed negative memories of their relationship in order to make her decision to end their engagement more acceptable, and how difficult it was for her to be confronted with the truth that her relationship was not actually so bad:

> *"I said that our relationship was horrible, and my ex-partner said 'No, go through your chat, it wasn't horrible.' When you go through my chat, you can indeed see that we had a very good relationship, until I fell in love with someone else. It was very confronting; I wanted it to be bad, because then I would have a reason to break up."*

The digital possessions that evoked this bittersweet reflection had negative qualities, but as the participants were able to see a purpose in keeping and interacting with those digital possessions, those negative qualities had a positive effect; for example, reminding Ava-34 of the reality of her past relationship, or confirming for Noah-52 that he made the right choice for himself, even though the consequences of those choices were difficult to deal with.

5.3.3 Managing Digital Possessions

Participants talked about managing their digital possessions after their relationships ended: keeping their possessions; deleting them; or abandoning them and letting them fall into disuse. Some even used a combination of these strategies. Debora-19, discussed a social media post her ex-partner made to her online gaming profile when they were dating, which said "I <3 YOU!". Deborah-19 explained that she wanted to keep her ex-boyfriend's post after their break up, but also wanted to not keep it at the same time:

> *"I screenshotted it after we broke up, because I thought that he would delete it. I wanted to have it somewhere safe. But after I screenshotted it,*

I deleted it! I just wanted to keep it in 'the folder in the closet', not out there in the world."

By saving a screenshot of the post before deleting it, Deborah-19 was able to keep a copy of this originally outward-facing digital possession from social media. This allowed her *control over the public narrative of her break up* (i.e. sending a message that she was moving on by removing her ex-boyfriend from her digital space), while also giving her the opportunity to keep a snapshot of a digital possession that held meaning to her. Similarly, Baozhai-21 discussed her motivation for deleting all of the chat history and text messages between her and her ex-partner after their break up, commenting:

"It was too hard to see the messages, and it reminded me of how good it used to be, before he betrayed me."

Conversely, Mia-20, found it difficult to delete all of the chat history and text messages between her and her ex-boyfriend, which led her to take no action at all on those digital possessions after her break up. Ironically, this inaction led to a type of curation, as when she upgraded her phone, Mia-20 did not transfer her text messages and chat history to it, creating space between herself and the digital possessions by abandoning them on her old phone:

"I was doubting the decision I made, but then that's why I needed to leave them off my new phone, because I kept doubting myself."

It was a common strategy across participants to *simply abandon digital possessions* rather than deal with them through any sort of active curation or management. Emily-23 and Wilson-22 both spoke of the trade-off between effort and reward in managing their digital possessions post-break up, Emily-23 commenting:

"I just don't see the point in removing [Facebook and Instagram photos]. I could, but who would even know? I could literally delete them all now, but no one would even know because no one goes and looks that far back. Everyone's only looking at the last year or so."

Wilson-22 echoed this, commenting:

"I didn't delete [the photo], I just couldn't be bothered. There were not so many pictures that I would see day-to-day, so I was like, why would I

even start deleting that stuff?! I didn't think it was worth it to start throwing stuff out."

While Bella-20 also simply left many of her digital possessions where and as they were after her relationship with her girlfriend ended, her efforts to maintain a friendship with her ex-partner may have influenced her decision not to actively curate or manage her collection. Bella-20 cited the fact that deleting the digital possessions would not change the past, and that her ex-partner still held meaning to her:

"I don't see the point in getting rid of it at all, because it happened, and it was part of my life, and he's still really important to me."

During the interviews, almost half of the participants (n=6) discussed how they felt about the act of curating. Ava-34 mentioned the concept of a priority list to deal with different aspects of breaking up, including tasks such as separating financially from an ex-partner, and dividing up cherished physical and digital possessions. When discussing who would retain the use of her and her ex-fiancé's shared Facetime account, Ava-34 said:

"For some reason, the digital is on, really, the lowest part of the priority list. Even though I am abroad, and the digital is a communication medium, and it's definitely important to me, it's still the lowest of my priorities."

Ava-34 and her ex-fiancé were together for fourteen years, and had not only shared digital possessions, but physical possessions as well, including a house they bought together. Although Ava-34 could see the importance of digital possessions and the digital medium in the context of her relationship with her ex-partner, she relegated digital things to the bottom of her priority list – not because she felt they were unimportant, but because she felt there were other more important things to deal with in the context of her break up:

"I don't think it has anything to do with the fact that things are digital or physical, but more that you have to start somewhere, and I think emotional is first. Because when you're still emotionally attached, you don't want to break up anything… And then the visual things. One of the first things I did was go back to [country] and take all my clothes, in case

he brought a girl home… These were first, then financial. And I think digital would be at the end of my list."

Ethan-24, spoke of the statements an individual could make with their choices concerning the curation and management of digital possessions in the context of a relationship break up. Not only could taking or not taking action to manage or curate a collection of digital possessions send a message to an ex-partner, and to a wider social network, but the type of action taken could also make a statement:

"The content you have on social media, on Instagram, or Facebook, is always there until you choose to delete it. These things don't just delete themselves… you can read a lot into that."

Wilson-22 echoed Ethan-24's thoughts, although he framed it in a simpler and more positive way:

"If you keep pictures of someone, then that means that the person has meaning to you."

Wilson-22's comment was made during a discussion about why he decided to keep photographs of his ex-partner on his phone, where only he had access to them. To Wilson-22, the actions of curating and managing digital possessions after a break up in a private digital space also has meaning and makes a statement to him as an individual.

5.3.4 Experiences of Technology

Technology was not always seen to be beneficial in the context of managing digital possessions after a break up; in some cases, it *made the process more complicated* (Moncur et al., 2016). After his relationship came to an end and Ethan-24 began seeing a new girlfriend, he decided that he would delete every digital possession from his past relationship from his computer. Despite approaching the task with the intent to cull everything connected to his ex-partner and their relationship, Ethan-24 discussed how he was unsuccessful in his efforts due to a number of issues. Although he was able to delete digital possessions that were easily searchable, Ethan-24 found that many digital possessions survived his cull:

"Not all of it, but an awkwardly high percentage is still around. Everything that is searchable by name is removed: documents, leases, forms, little joint bits and bobs are all gone. But it's the stuff labelled 'IMG_911' that

you can't identify without opening it that's still around. There's no meta-data that helps, no field you can… Yeah. It's an issue."

Most of the participants (n=10) talked about *unmet needs and potential solutions* when it came to managing their digital possessions after their relationships ended. Zoe-33 highlighted an issue in that she felt there was very little support available even for selectively deleting digital possessions. Beyond going through and deleting every item individually, she felt there was no *'easy option'* to do so, and that as it currently stands, curating at an individual level was not something she had *'the time or energy to be doing'*.

Ethan-24 faced a second issue when it came to deleting all of the digital possessions from his past relationship; even though he could delete the most obvious and easy to identify possessions, he was frustrated to find that his computer took it upon itself to restore the files that he had successfully deleted. Using Time Machine on his Mac to make files he wanted to keep safe recoverable, Ethan-24 was surprised to find the program was keeping files that he thought he had permanently deleted, both from his hard drive and from his back up. Technology was forging a connection between Ethan-24 and his ex-partner of its own accord:

"You scroll back chronologically, and the file is still there! So, I just don't know what to do. It's like it's wanting to help you by saying 'You might want to get this back!', but I was like, 'I'm okay, I really don't want this back. Just let it go!'"

Similarly, Bella-20 had experiences of technology connecting her to her ex-partner after their relationship came to an end; as a result of the pair wanting to remain friends post-break up, they did not remove one another as Facebook friends. This became problematic, as Bella-20 and her partner never shared a relationship status on the SNS, so as far as it was concerned, the two had the same friendship they always had:

"The worst is when you find photos of them with new people. That was horrible… It would have been useful if Facebook didn't feel the need to tell me."

On a related note, Emily-23 thought that, practically, she could have deleted the digital possessions connecting her to her relationship, but felt that on an emotional

level there was no way she could have done so. Having been the one to end the relationship, there was guilt associated with dismantling the collection of digital possessions that connected her and her ex-partner together:

> *"I felt like such a shitty person that I don't think I even had the option to delete things. I think it would have been really hurtful, because you don't know if he's going back on to look at those pictures."*

Emma-25 was troubled by the *lack of control* on applications such as Google Photos. She expressed a desire to do more than simply delete the photos that she did not want to see; being able to organise and curate the collection to give it order after her break up would have been useful for her:

> *"I wish I could go on Google Photos and, where all your photos are laid out, I wish I could mark certain ones not to be shown in the giant list of doom. Just hide them, stash them away somewhere, in an archive or something."*

In terms of solutions to problems they faced when managing their digital possessions after a break up, Deborah-19 and Wilson-22 both wanted to see their digital friendships more accurately reflect the state of their relationships in the physical world. Deborah-19 called for a feature on Facebook that would let friendships fade over time if the individuals involved did not interact with one another enough; if the connection between individuals lapsed completely, the friendship would be disconnected. Wilson-22 echoed this, in terms of the visibility of his digital possessions, saying he would like:

> *"Something that would behave the same way a relationship does. So when people start to go rogue on each other, it would go rogue as well."*

Emma-25 expressed a desire for a *'Netflix decoupler'*, in order to separate out personal preferences that were intertwined with those of an ex-partner on a previously shared account. Ethan-24 wanted some way of limiting the reach of digital possessions, curtailing the replicability of the digital domain in exchange for more clear ideas around ownership:

> *"If you couldn't copy a file, so that it could only exist in one place… Maybe through a format of some kind. Or, maybe if it is copied, it has a parameter that says 'this file is in six locations other than here'."*

Baozhai-21 and Ava-34 had opposing views on a 'one click removes all' feature; Baozhai-21 wanted a sophisticated method of removing any digital possessions that connected her and her ex-partner together, where with one button she could *'use facial identity on photographs, one click to delete everything containing his face on social media'*. Ava-34, on the other hand, was keener to maintain a connection to her ex-partner, and the idea of having such an easy method to disconnect and separate from him did not appeal to her – especially so recently after their relationship ended:

> *"Right now, I'm holding on tight to all my friends and my ex-partner, and his friend's; I want to keep everything connecting me to them. So, when you have one button… Boom! My God!"*

Olivia-19 also wanted the opposite of Baozhai-21; she thought it would be beneficial to have a way of compiling all of the digital possessions related to her relationship in one place, to form a kind of digital memory book where she could keep the memory of her ex-boyfriend safe:

> *"If there could be a way to compile everything we'd ever written, text messages, everything… It would have been nice to have all that in one place, just to have it separate, and to be able to look back on the nice things."*

5.3.5 Summary of Results

Communication technologies play a large role in relationships, but when relationships are coming to an end, or after they have ended, these avenues for communication can cause issues for individuals.

Participants in this research discussed their experiences with communication technologies in the context of a relationship break up. The participants talked about the difficulty in being easily contacted by their ex-partners through communication technologies, and their experiences of both (a) avoiding contact and harassment from an ex-partner, and (b) being avoided in their efforts to get in touch with an ex-partner. Participants explored their experiences of filtering future content on their social media with their ex-partner in mind, and their use of social networking sites as surveillance tools to check in on their ex-partners' wellbeing after their break up.

The varying roles that digital possessions played for participants were explored in the sessions. Digital possessions were used as evidence socially (proof of the experience of a bad relationship), with law enforcement (proof of harassment as the basis for police action), and kept for potential future use as evidence in court (during divorce proceedings). Participants discussed their experiences of digital possessions cuing both positive and negative memories, and digital possessions as catalysts for reflection were explored.

Participants talked about their experiences in managing digital possessions after a break up, discussing the distinction between curating and deleting digital possessions in public and private settings. The participants also relayed their experiences of simply abandoning digital possessions as a result of having no viable curation alternative.

Finally, participants discussed their experiences of using technology after a break up in the context of managing their digital possessions, highlighting issues around technology attempting to help (but often hindering the process), unmet needs for curation and management (where participants had no support from technology in achieving their specific curation and management goals), and potential ways in which technology could help them disconnect from an ex-partner in a digital context.

5.5 Discussion

The results from this research go towards developing an understanding of the ways in which technology makes it difficult for individuals to disconnect after a relationship ends; it also provides direction for how technology could be designed to better help individuals manage their digital possessions after a break up. In this section, I discuss some of these difficulties and outline guidance for designing technology and systems that could help people to achieve these goals.

5.5.1 Decoupling and Disentangling

An opportunity for design identified in the previous chapter was that of *Disconnecting and Reconnecting*. Upon breaking up, partners were seen to need support in disconnecting from one another digitally, but with the potential for reconnecting with one another in the future. As seen in the experiences of participants in this chapter, communication technologies and social networking sites were used by both the participants and their ex-partners to disconnect and reconnect; unfortunately, neither individual was seen to have complete control over

their connection with an ex-partner as a result of these technologies. The harassment Zoe-33 and Sophie-25 experienced highlights the way in which an ex-partner can force an unwanted connection in a digital context, despite the participants' efforts to disentangle themselves from those ex-partners. In contrast, Ava-34's decision to ignore her partner by allowing her phone to run out of power shows that it is possible to create space and successfully step towards decoupling from an ex-partner. This study enhances the findings of Stephanie Tong's research (Tong, 2013); while Tong investigated the perspective of individuals aiming to maintain a connection with their ex-partner post-break up, this research provides the parallel experience of individuals aiming to dismantle that connection. The findings from these interviews suggest that when individuals have conflicting goals when it comes to maintaining or breaking a connection after a relationship ends, it becomes harder for either partner to succeed in doing so.

Many of the participants in this study expressed a desire to decouple and disentangle from their ex-partners digitally, but I believe that designing for this requires subtlety not seen in currently available apps such as Killswitch, as discussed in the Background and Related Work chapter. After a relationship ends, an individual is likely to see the opportunity to disconnect from their ex-partner as useful, helpful, and sometimes necessary. However, when entering into a relationship, and certainly during a relationship, the concept of having an escape plan is counter-productive. If decoupling and disentangling from an ex-partner is part of the process of moving on from a past relationship, then entwining and connecting to a partner is part of the process of being in a relationship; both are important parts of the experience, and must be designed for. Technology designed for separation should not discourage partners from becoming connected in the first place.

It may be that partners should be encouraged to engage with systems that help form digital connections, while at the same time have those system work in the background to prepare for a potential break up. Ethan-24 felt that he was unable to disconnect from his ex-partner due to the digital possessions that he could not find to delete, despite his best efforts to do so. If a system were designed to encourage Ethan-24 to cherish his relationship by storing and managing his digital possessions connected to the relationship while in it, that system would be supporting him in connecting and entwining with his partner in a digital context. Then, in the wake of a

break up, if Ethan-24 decided that he wanted to manage and curate the digital possessions from his relationship, he would find all of his digital possessions in one place, greatly reducing the administrative cost of curating his collection.

Other scenarios are more complicated; for example, when a digital possession is truly shared by partners, as in Sophie-25's experience of sharing a single Netflix profile over the course of her relationship. She and her ex-partner's viewing preferences became well and truly interwoven in a way that cannot currently be detangled. When systems are shared by both partners during a relationship, is the best course of action to simply delete the shared profile and start fresh? Or should individuals be able to revert their profiles back to a version from before they shared it with their ex-partner? In the case of a shared Netflix profile, the system could present individuals with a list of all the shows and movies watched since the profile was created, and request that they select all the content that they enjoyed and would like to see more of, which would inform the preferences for a new individual profile. Doing so would certainly go towards decoupling the ex-partners digitally and would provide an opportunity for each partner to begin creating shared data with a new partner without having to worry about old relationships resurfacing in the 'Recommended for You' screen.

No other research explores designing for disconnecting in digital spaces not intended for us by more than one person. These findings highlight the need for more work around disentangling digital presences on platforms not intended for use by multiple people (or in this case specifically, romantic partners).

5.5.2 Maintaining Limited Connections

Despite participants discussing their desire to more easily decouple and disentangle from their ex-partners, some participants actively used digital possessions from their past relationships after breaking up, thereby maintaining a connection with their ex-partners. Zoe-33, Emma-25, and Noah-52 discussed the different roles digital possessions from their past relationships played after their break ups: from supporting the narrative of their break up in social contexts (Zoe-33), to enlisting the support of the police in a law enforcement context (Emma-25), to preparing evidence in a legal context (Noah-52). These digital possessions were kept and used by the participants because they had practical purposes beyond the end of the relationships. However, interaction with these digital possessions in a post-

relationship context, regardless of their usefulness, maintained a link between participants and ex-partners.

The usefulness of the digital possessions in each of the three contexts listed above are likely to lessen as the amount of time since the break up increases; for example, as Zoe-33's break up becomes less recent and she needs to explain her new relationship status to fewer people, the chat histories she used as part of those social interactions will become less useful to her. Eventually, Zoe-33 could delete these digital possessions, and the connection to her ex-partner through those specific chat histories could be severed. In this instance, the participants could benefit from periodic prompts to review and curate digital possessions connected to their ex-partners (identified, for example, through tags on social media, or face detection in photographs).

Emily-23, Olivia-19, and Zoe-33 expressed a desire to disconnect from their ex-partners, but were clear that they did not want to completely block or fully separate themselves from their ex-partners. Instead, the three participants wanted to maintain a limited, or preferably one-way, connection with their ex-partners. This came about because of their need to assuage the guilt they felt at ending their relationships, which manifested in a desire to occasionally confirm through social media that their ex-partners were managing well after their break ups.

To maintain connections with their ex-partners could have been damaging for Emily-23, Olivia-19, and Zoe-33 (Fox & Tokunaga, 2015; Lyndon et al., 2011; Marshall, 2012; Tong, 2013), but in each of their break up experiences, the guilt from ending the relationships and the anxiety from not knowing how their ex-partners were coping with the break up could also have been damaging. In order to move on, these participants felt that they needed to be able to see that their ex-partners were moving on as well. Systems based around revealing the general tone and level of an ex-partner's online activity without simply letting an individual view their ex-partner's profile could play around this tension between an individual's desire to move on, and their need to check on the wellbeing of an ex-partner.

5.5.3 Taking Action Through Interaction

The interactions available to individuals for the curation and management of their digital possessions in a post-break up context are limited in that they are the same grammars of action (Harper et al., 2013) available for the management and curation

of digital possessions in most other contexts: create; save; update; share; and delete. The curation methods discussed by participants in this research aligned to the roles discussed in Sas and Whittaker's work (Sas & Whittaker, 2013), but (as with findings in the previous chapter) again suggest a potentially new role of '*Abandoner'*: those individuals who purposefully take no action and make no decision as to curating digital possessions, thereby not engaging in a *Keeper* or *Deleter* role. The limited ways in which participants could interact with their digital possessions restricted their ability to manage those possessions in a meaningful or useful way, and adopting the role of *Abandoner* was seen as the only option.

Mia-20 was a prime example of this, as she did not want to delete her digital possessions, but equally did not want to interact with them. Although she was unsatisfied by simply abandoning her digital possessions as a method of curation, a more specific and relevant interaction was not available to her. There is a cyclical limitation in Mia-20 lacking access to a suitable curation method; she did not know what type of curation action she wanted to take because that action does not exist, and that action does not exist because Mia-20 does not know what sort of curation action she wants to engage in. In the previous chapter, John-33 had a similar experience. He felt unable to effectively manage the digital possessions he viewed as being tainted by their depiction of, and connection to, his ex-partner – again, this participant was left with inaction as a curation method because of a lack of available actions.

There is an opportunity then to explore and create new ways of interacting with digital possessions beyond create, save, update, share, and delete by designing and implementing new interactions specifically aimed at supporting individuals to manage and curate digital possessions from a past relationship in new ways, in order to support them in moving on. An example of this may be that an individual wants to do more than simply delete a chat history with their ex-partner; instead they may want a sense of finality to be implicit in their interaction and decide to 'Obliterate' it. Obliterating a digital possession could involve moving a possession, and all back-up copies, to the recycle bin, permanently deleting it from the recycle bin, and then defragmenting the hard drive locally to ensure that even the physical presence of the digital possession has been removed.

5.6 Conclusion

In this chapter I contributed an examination of the ways in which individuals interact with their digital possessions after a break up, in an effort to understand how technology could be designed to support individuals in disconnecting from one another through the management and curation of those digital possessions following a break up. The research reported on in this chapter answers the second of the three research questions outlined in Chapter 1 of this thesis: How are digital possessions relating to a relationship managed (or not) after a relationship break up? By analysing data from 13 semi-structured interviews I explored themes of communication and avoidance, the role of digital possessions, managing digital possessions, and experiences of technology.

The themes discussed in this chapter demonstrate that participants are not always satisfied with the ways in which they can currently manage their digital possessions. There are often attempts to manage digital possessions in the context of a break up, but the grammars of action available to individuals are not always useful in supporting them to achieve their curation and management goals, and have resulted in participants simply abandoning digital possessions rather than investing effort into figuring out a more appropriate mechanism for curation beyond what is currently available.

There is an opportunity to investigate the ways in which individuals feel that technology has let them down when it comes to the management of their digital possessions after a break up, in order to design grammars of action that are more useful in the context of a romantic relationship ending. In the next chapter I report on research that explores the ways that technology has failed individuals in managing their digital possessions after a break up, to form the basis for the design of new grammars of action that fulfil their needs.

CHAPTER 6.
LIMITATIONS OF TECHNOLOGY IN CURATION AND MANAGEMENT OF DIGITAL POSSESSIONS

CHAPTER SUMMARY

In the previous chapter, 13 semi-structured interviews were analysed, resulting in four themes: Communication and Avoidance, The Role of Digital Possessions, Managing Digital Possessions, and Experiences of Technology. These themes prompted discussions around disconnecting from an ex-partner through the management of digital possessions and highlighted a need for more useful and specific grammars of action in this context.

In this chapter, I report on the results of 10 semi-structured interviews aimed at gathering stories of times when technology had let people down, specifically when it came to managing their digital possessions ***in the way they wanted*** *after a break up. Four themes are explored in this chapter: Ex-Partners in Control of Digital Possessions, Managing the Digital Traces of an Ex-Partner, Managing Narratives by Managing Digital Possessions, and Consequences of Creating Digital Possessions.*

Exploration of these themes led to the construction of three design dimensions: Temporality; Stewardship; and Context.

6.1 Introduction

In the previous chapter I discussed the need for new grammars of action to support individuals in managing their digital possessions in the context of a relationship break up. Participants described being forced to adopt strategies such as abandoning digital possessions because they saw no viable alternative for managing them. Subsequently, the aim of the research documented in this chapter was to understand the ways in which technology had limited individuals in managing their digital possessions after a break up, to guide the design of new grammars of action in this context. To achieve this, I carried out 10 semi-structured interviews, which focused on gathering stories of times when individuals felt they had been let down by technology when it came to curating and managing their digital possessions after a break up. The interviews were transcribed and analysed, resulting in the themes of: Ex-Partners in Control of Digital Possessions; Managing the Digital Traces of an Ex-Partner; Managing Narratives by Managing Possessions; and Consequences of Creating Digital Possessions. Considering how I could guide the design of new grammars of action to challenge the curation limitations participants dealt with led to the creation of three design dimensions: Temporality, Stewardship, and Context.

6.2 Study Setup

6.2.1 Procedure

As with the previous two studies, semi-structured interviews were carried out on a one-to-one basis with 10 participants. The interviews were split into two parts; as with the previous interviews carried out in this PhD, the first part was focused on gathering background information on the relationships that the participants would be talking about. Open-ended questions like *'What was the relationship like?'*, *'Would you consider it to be a serious relationship or not? And why?'* were used to give the subsequently told stories context within the confines of each individual's relationship.

The second part of the interviews was the main research focus. Participants were asked to share stories of times that technology let them down when it came to managing their digital possessions after a break up. If participants struggled to come up with ideas, two prompts were prepared to aid in engaging them. The first prompt was the list of different types of digital possessions originally introduced in

Chapter 5. The list was again stressed to participants as being non-exhaustive, and included digital photographs or photo digital albums, social media posts, video clips, chat histories, audio files, emails, accounts that the participants and their ex-partners shared ownership of, accounts that the participants and their ex-partners shared the use of, text messages, and other.

A set of secondary prompts was prepared based on experiences that past participants had encountered when it came to interacting with digital possessions in the context of a break up. Participants could be asked to think about times when they:

- *Came across a digital possession from the relationship unexpectedly, and how they dealt (or didn't deal) with it, after the break up;*
- *Had to deal with digital possessions that they wanted to get rid of, but felt they couldn't, after their break up;*
- *Had to deal with digital possessions that they wanted to save or keep, but felt they couldn't, after their break up;*
- *Wished they had been able to take some sort of action when it came to their digital possessions, but were limited by whatever platform they were using.*

A full interview guide for these interview sessions can be found in Appendix D. The mean interview time was just under 59 minutes (shortest interview was 36 minutes 27 seconds, longest interview was one hour, 10 minutes).

6.2.2 PARTICIPANTS

60% of the participants in this study were female, and the majority of the participants identified as heterosexual; Ryan-27 and Lisa-51 identified as homosexual. The majority of the participants were in the 20's, but the participants' ages ranged from 22 to 51 years old (with a mean age of 29.5 years old).The demographic information for the participants is summarised in Table 4 below, but to give context for the results from these interviews, I provide a short background for each participant:

Emma, 26

Emma-26 and her ex-partner met while they were at university and started dating soon after. After two years together they moved in with one another, living together for a subsequent three years. Their relationship did not end amicably, with Emma-

Participant	Gender	Relationship Duration	Time Since Break Up	Person that Ended the Relationship
Emma-26	Female	5 Years	4 Years	Mutual
Wilson-23	Male	4 Years	2 Years	Participant
Ryan-27	Male	3.5 Years	6 Years	Participant
Lisa-51	Female	1.5 Years	9 Months	Ex-Partner
Ava-35	Female	14 Years	1.5 Years	Participant
Charlotte-22	Female	5 Years	2 Years	Mutual
Ethan-25	Male	2 Years	2 Months	Mutual
Matthew-32	Male	4 Years	3 Months	Participant
Natalie-28	Female	1 Year, 2 Months	4 Years	Ex-Partner
Lucy-26	Female	1 Year	5 Months	Participant

Table 4: Table summarising the demographics of participants in Study 3.

26's ex-partner using previously shared devices to access her Facebook account after they broke up. Emma-26's ex-partner used the information he gathered from reading her chat histories with other friends to spy on her after the relationship ended; Emma-26's ex-boyfriend eventually revealed his access to her accounts by referencing one of her chats in an argument. At the time of this interview, Emma-26 had been separated from her ex-partner for four years, and was in a new relationship. She also took part in the study documented in the previous chapter.

Wilson, 23

Wilson-23 and his girlfriend had not been dating for long before he had to move to another town in their country to attend school. Their relationship became long-distance for the six months that he was away, before he moved back to the same town and they resumed a relationship living nearby one another. After a year, Wilson-23 was accepted to attend university in the UK, and again moved away from his ex-partner, re-entering into a long-distance relationship. The physical distance was much greater than their previous time apart, and they were not able to visit one another as easily; after a year of struggling to maintain the long-distance relationship, Wilson-23 decided to end it. He also took part in the study documented in the previous chapter.

Ryan, 27

Ryan-27 met his ex-boyfriend on the social networking site MySpace. Initially the two struck up a friendship through MySpace and Bebo (another social networking site), before agreeing to meet in person for coffee. Ryan-27 was from a small town and there were no other gay people his age in the area; he felt that his relationship initially boosted his self-esteem, his confidence, and generally made him feel good about himself. Unfortunately, this did not last, and eventually issues around his ex-partner's family life, friends, and behaviour towards Ryan-27 contributed to their relationship ending.

Lisa, 51

Lisa-51 and her ex-girlfriend became friends after meeting at a French language class and began dating around six months later. Lisa-51 believed that the relationship changed her for the better as a person, and that it was deeply meaningful to her, despite how it ended. Lisa-51's ex-partner got a job in another country, and so Lisa-51 moved there with her ex-partner and her ex-partner's daughter. While living abroad their relationship became strained, Lisa-51 citing living arrangements and the relationship between herself and her ex-partner's daughter as major contributing factors to her break up. Eventually Lisa-51 became ill and moved back to the UK for treatment, at which point the stress of moving and the illness put too much strain on the relationship, causing Lisa-51's ex-girlfriend to end it.

Ava, 35

Ava-35 and her fiancé were together for a total of 14 years. Ava-35 moved to the UK for work, with the intention that her partner would finish off his job at home before moving to join her. While in the UK alone, Ava-35 fell in love with another man. She and her fiancé broke off their engagement but stayed together for a time, before subsequently ending their romantic relationship. Although at the time that she took part in this research Ava-35 was in a relationship with the man she fell in love with in the UK, she and her ex-partner remained close, with regular contact over social media and video chat, as well as in person. She also took part in the study documented in the previous chapter.

Charlotte, 22

Charlotte-22 and her ex-partner were together for around 7 months after meeting through a mutual friend in high school. The pair split up briefly before getting back

together, at which point Charlotte-22 felt that their relationship became more serious. In total Charlotte-22 and her ex-partner were together for 5 years, eventually breaking up because Charlotte-22 moved away for university. Moving to a different city put too much stress on their relationship, and she and her boyfriend began to drift apart, eventually leading to the end of their relationship. Charlotte-22 and her ex-partner are still in contact, and were good friends at the time of this interview.

Ethan, 25

Ethan-25 and his girlfriend were matched with one another on Tinder. After chatting with one another via the app, they decided to meet up, and eventually began dating. After some time Ethan-25 worried that their relationship had become 'too comfortable'; that he and his girlfriend were not as compatible as they initially thought, and that they were only staying together because it was easier than breaking up. Although they addressed his concerns, both digitally and in-person, communication between the two broke down, and eventually they split up. He also took part in the study documented in the previous chapter.

Matthew-32

Matthew-32 met his ex-girlfriend at a party through mutual friends a few months after breaking up with his previous partner. He felt that their romantic relationship grew organically as a result of their friendship. During their relationship, Matthew-32's ex-partner moved to live in another city, as this was something she had planned to do before the pair began dating; most of their relationship was spent long-distance. Although Matthew-32 thought that the relationship was quite a positive experience to begin with, he felt that by the end of their second year together it became a struggle to remain a couple. Matthew-32 and his girlfriend persevered and stayed together for another two years until the effort required to stay together became too much and the relationship came to 'an abrupt end' when Matthew-32 felt he had no choice but to break up.

Natalie, 28

Natalie-28 and her ex-boyfriend met when they were at university together. Upon meeting one another they discovered that they were neighbours, took the same route to school each day, attended the same degree course, and took all the same classes. They were friends for five years while they studied at university, before becoming romantically involved after graduating, eventually decided to get engaged.

Their relationship became long-distance for six months, after which time Natalie-28's fiancé decided to end their engagement and their relationship. Natalie-28 was frustrated because her ex-partner did not give her a specific a reason for their break up, telling her only that he felt they were drifting apart, and that the relationship simply wasn't working for him any longer.

Lucy, 26

Lucy-26 and her ex-boyfriend both worked at the same store. Lucy-26 worked as a sales assistant, and her ex-boyfriend worked as the IT manager. Although they worked together, neither knew the other particularly well until they became friends through office nights out and social events. It was fairly soon after they began dating that Lucy-26 and her ex-boyfriend moved in together, and were quickly living 'day-to-day life in a home that [they] shared'. Lucy-26 cites her ex-boyfriend's jealousy and lack of trust as the largest contributing factor to the end of their relationship, with her ex-partner becoming controlling and jealous of anyone that Lucy-26 spent time with other than him. Lucy-26 suddenly realised that she was becoming accustomed to how badly her ex-partner was treating her, and one night decided that it would be best for her own mental health to end the relationship. The pair still worked at the same store at the time of the interview, but their break up had caused issues for Lucy-26 at work, despite her best efforts to keep their work relationship civil.

6.2.3 Analysis

Figure 5: Five researchers analysing 50% of the interview data through the creation of an Affinity Diagram.

Each participants' interview was fully transcribed and analysed through the construction of an affinity diagram. A total of 162 affinity notes were created from across the 10 transcripts, broadly relating to the aims of the study. These affinity notes were printed on to individual slips of paper and divided into two sets of data at random, both equal in size. The first set of data was given to a team of five researchers to be analysed over the course of a day-long session, as can be seen in Figure 5.

After their initial organisation of the data, the team of researchers had created 20 groups of data. They iterated on their data structure twice, resulting in six final groups. I then analysed the second data set using the structure developed by the team of researchers as a guide. I iterated on the structure of the affinity diagram twice, removing some data that was not relevant to the research, and combining similar groups together to result in four themes that I expand on below.

6.3 Results

In this section, I report on the results of the affinity diagramming process and explore four themes: Ex-Partners in Control of Digital Possessions; Managing the Digital Traces of an Ex-Partner; Managing Narratives by Managing Digital Possessions; and Consequences of Creating Digital Possessions.

6.3.1 Ex-Partners in Control of Digital Possessions

To be able to curate and manage digital possessions after a break up, individuals needs to have access to and control over those digital possessions. Half of the participants that took part in this research (n=5) shared stories of times when they

lacked control over the digital possessions from their relationships, and instead their ex-partners had jurisdiction over the curation and management of those possessions.

Wilson-23 and Natalie-28 discussed the issues they dealt with when their ex-partners made decisions about digital possessions that the participants felt they had ownership (or at least shared ownership) of. Wilson-23 discussed a photograph of himself and his ex-girlfriend that was taken on his prom night. The photograph held a lot of meaning to him, and Wilson-23 considered it to be a reminder of one of the happiest experiences of his relationship. After Wilson-23 broke up with his ex-girlfriend, she deleted the photo from her Facebook, removing Wilson-23's access to it without giving him any opportunity to save his own copy of the image first:

> *"She had the photo of us from prom on her Facebook profile, and it was an important photo for me. She deleted the photo, I think because she didn't understand why I broke up with her. I went looking for the photo one day and it just wasn't there."*

The photograph was taken by Wilson-23's ex-girlfriend's family on their prom night, and was uploaded to his ex-girlfriend's Facebook page. Despite the fact that the only copy of the photograph was displayed on his ex-partner's page, Wilson-23 and his ex-girlfriend were both tagged and depicted in it – he considered it to be in part his possession. However, as the digital possession existed only on his ex-girlfriend's Facebook profile, ownership and control over that digital possession rested solely with her. The decision to delete the digital possession was hers alone, and Wilson-23 had no say in it.

While Wilson-23 was concerned with the fate of one image in particular, Natalie-28 had to deal with her ex-partner assuming control over the majority of the photographs from their relationship after their break up. While they were together, Natalie-28's ex-fiancé took most of the photos from events they attended because he owned a professional quality camera; during the relationship, this made the most sense. Consequently, he was also the one that uploaded the majority of their photographs to social media.

After their break up, Natalie-28 began to consider how little control she had over the photographs, and the consequences of her ex-partner's singular ownership over the digital possessions:

> *"If he wanted to delete the photos I want, I have no control over that. If my new partner wants me to delete these old photos that I have no control over, I have to contact my ex that I haven't spoken to in three years, just to ask him."*

More than just worrying about her ex-partner having the power to delete her digital possessions, Natalie-28 was concerned about her *inability* to delete digital possessions from her relationship:

> *"I would have to ask him to organise my memories. Ultimately, they are his photos… He has the upper hand over my memories."*

Natalie-28 viewed these digital possessions as memories of her relationship; part of her past. By being solely responsible for the curation of those photographs (i.e. being individually in charge of what digital possessions to keep and delete), Natalie-28's ex-fiancé not only had control over her memories, but as those digital possessions existed on social media, he also had some control over her digital identity.

Emma-26 faced a similar issue around her ex-boyfriend's level of control over her digital identity. While Natalie-28's ex-fiancé had ownership of photographs that Natalie-28 considered to be at least jointly her digital possessions, Emma-26's ex-partner fabricated digital possessions that supposedly belonged to Setphanie-26:

> *"There are websites you can go to and type whatever details you want, and it makes a conversation where it looks like it's two people talking to each other."*

Emma-26's ex-partner aimed to cause issues for Emma-26 socially by sharing screenshots of a faked chat history that alluded to an affair she supposedly had with a friend (who himself would have been in a relationship at the time the affair was to have taken place):

> *"He faked conversations about an affair, like Facebook Messenger threads, and sent them as screenshots to people we both knew."*

Emma-26 had no control over these fake chat histories; her ex-partner was in control of the narrative of the alleged affair and appeared to have evidence to prove that it had happened. In this way, he was curating Emma-26's online identity by creating and sharing digital possessions that only he had control over.

6.3.2 Managing the Digital Traces of an Ex-Partner

After the end of their relationships, over half of the participants (n=6) dealt with digital traces of their ex-partners in various mediums. I use the term digital traces to refer to digital possessions (or parts of digital possessions) that act as a connection to an ex-partner without the ex-partner being explicitly present or depicted in that digital possession.

While together, Wilson-23 and his girlfriend shared the use of his eBay account, with his partner using it more frequently even than Wilson-23 did himself. After their relationship ended, Wilson-23 found traces of his ex-partner on his eBay profile, specifically in the 'recommended for you' section of the site:

> *"She was using my eBay to view and buy beauty stuff, and after we broke up, my account had all these recommendations for her – and I can't change that. Even though I deleted my history, that stuff doesn't go."*

Despite his best efforts to do so, Wilson-23 was not able to manage or curate his profile in order to remove the traces of his ex-girlfriend. Deleting his purchase history seemed like a logical way to clear the recommendations, but instead it only removed the history from the top of his eBay homepage, and moved the recommendations into its place – making it the focus of his profile. At the time that this research was being carried out, eBay did not support users in managing or deleting their recommended items. The only options for Wilson-23 to manage these digital traces of his ex-girlfriend would have been to either make purchases on his account that would encourage the recommendations algorithm to start suggesting more relevant products, or to delete his account and start a new one.

Wilson-23's choice between keeping his account and simply ignoring the digital traces, or starting a new account free from the digital traces, but without his reputation as a good buyer and seller on eBay, is not ideal. It highlights how services that are not centred around relationships, or even designed with multiple users on one profile in mind, can nonetheless be effected by a relationship ending.

Emma-26 and her ex-boyfriend shared their Google Calendars with one another when they were together; something Emma-26 had to deal with after their break up. A few months after the end of their relationship, Emma-26 realised that her ex-partner's events were appearing in her calendar, and that her own events would be appearing in his:

> *"I removed him from my calendar, because I couldn't just unshare it, but I couldn't unsubscribe from his because he'd shared it with me – Google Calendar was so old that there was no 'no thank you' button!"*

Although she could remove her digital traces from her ex-partner's calendar, Emma-26 was not able to remove his from her own calendar. Eventually this functionality was added by Google, but for a time Emma-26 was forced to organise her daily schedule around her ex-partner's events.

Similarly to Wilson-23's issue with eBay, Google Calendar was not designed to consider the needs of partners breaking up; Emma-26 and her ex-boyfriend did not end their relationship on good terms, and she did not feel that she could simply contact him and ask him to remove her from his shared calendar. Emma-26's options for resolving the problem were limited; when asked if she had thought of simply hiding her ex-partner's events on her calendar, she replied:

> *"His events were just sitting there! Yes, I could have made them invisible, but I would know they were always still there."*

Although a workaround to her problem did exist, Emma-26 did not consider it to be impactful enough in the context of managing the digital traces of her ex-boyfriend to be a viable solution.

Natalie-28 also came across traces of her ex-fiancé through using Google products. Although she did not actively engage with the chat histories between her and her ex-partner on Google Hangout, Natalie-28 decided to keep them to remember her relationship. As they were still associated with her account, Natalie-28 would occasionally see excerpts from her chat history in the results of her searches in her Gmail inbox:

> *"In Gmail, when you search for a keyword, it searches through your chats as well. Sometimes, I would search for something like 'New York' and then I get chat history from when we went there together.* [sarcastically] *It's like, 'yay, thank you, Google'. It feels like I'm accidentally stalking him."*

In an attempt to be thorough in its search results, Google created traces of Natalie-28's ex-fiancé any time she searched for email content that also happened to feature in their chat history. As with Wilson-23's experience, Natalie-28 could not

manage these traces without resorting to deletion of her digital possessions; she was limited in how she could manage her digital possessions based on the restrictions of the technology she used - something entirely outside her control.

Ryan-27 also had to deal with traces of his ex-partner in the form of meta-data on Facebook photos. While discussing how he tried to curate and manage his collection of photos on Facebook by untagging and deleting photos of his ex-boyfriend, Ryan-27 shared his experiencing of finding traces of his ex-partner on photographs that had nothing to do with their relationship:

> *"When I was going through all the photos, another thing I noticed was that he was there on photos that weren't even of me and him. Like, there were photos of me and my mum, and he had commented on them."*

Curating digital traces of his ex-partner appeared to be something that Ryan-27 had not considered until he was confronted with the task. Having to find these traces and subsequently decide what to do with them was difficult, but ultimately a part of moving on for Ryan-27:

> *"When you're looking through everything, it's these little things that just remind you… I found dealing with it all quite laborious, but I felt like I needed to do it."*

6.3.3 Managing Narratives by Managing Digital Possessions

Participants were aware that the management and curation of digital possessions in a public context (e.g. Facebook or Instagram) should be approached differently to the management and curation of digital possessions in a private context (e.g. photo albums on a phone). In a public setting, the curation of digital possessions establishes a narrative for the break up, and for the subsequent relationships between ex-partners.

Four participants shared their experiences of managing the narrative of their break ups by managing their digital possessions. Charlotte-22 explained that her approach differed depending on whether she was curating public or private digital possessions. When discussing how she dealt with the photos on her phone after the break up, Charlotte-22 commented:

> *"If it was something that would make me miss the relationship, I deleted it. But I kept things from when we'd gone places."*

This distinction between deleting and keeping certain digital possessions did not apply when those digital possessions existed on social media:

> *"On social media I didn't delete anything at all. I just felt like it was a bit too cold to just delete my digital footprint of the relationship."*

Charlotte-22 echoed Ethan-24 from the previous chapter in recognising that by deleting digital possessions in a public context, she would be making a statement as part of the narrative of her break up – something that she wanted to avoid. In contrast to Charlotte-22's concern about how her ex-partner would react to her deleting digital possessions on social media, Ryan-27 was more concerned with how a future partner would react to the narrative laid out by his curation and management of the digital possessions from his previous relationship:

> *"If I was dating and I wanted to meet someone else, I wouldn't want them to go on my profile and see everything from my relationship with him. They'd be like 'Oh God, that's a bit much'."*

Charlotte-22 and Ryan-27 were both mindful of the narratives their curation created but were managing their digital possessions with different aims in mind. Charlotte-22 wanted to maintain a friendship with her ex-partner, while Ryan-27 had no interest in maintaining a connection with his ex-boyfriend.

After her break up, Lisa-51 was less concerned with the narrative her own digital possessions laid out, but was instead focused on the narrative her ex-girlfriend would be sharing with the world on her social media:

> *"What bothers me is that she could go back through her photographs on Facebook and say 'Oh, that was just a random relationship, she was just my ex from such and such a time."*

Similar to the experiences reported on in the first theme, *Ex-Partners in Control of Digital Possessions*, Lisa-51 struggled with the knowledge that she would have no say in her ex-partner's narrative of their break up. Lisa-51 mentioned on multiple occasions throughout the session that although her relationship did not work out, it was incredibly important to her; to have no way of ensuring that the deep connection she shared with her ex-partner was reflected in her ex-partner's digital narrative of their relationship appeared to be very difficult for her.

6.3.4 Consequences of Creating Digital Possessions

In the previous chapter I discussed the idea that technology should support people in a relationship to create digital possessions that entangle and connect them; that partners should not be dissuaded from creating digital possessions because their relationship *might* come to an end at some point in the future. Ethan-25 echoed that sentiment in this subsequent study, when considering how technology could have made curating his digital possessions easier after his break up:

> *"Imagine if I opened my camera app and a message came up that said, 'Think of the longevity of this image – what are you going to have to do with it?' I would probably just put my phone away… But that's no way to be thinking, going into a relationship. You can't say 'I'm not going to take this picture because in three years' time I'll have to delete it'."*

As much as I still believe that encouraging partners to entangle and connect in a digital context is the right approach when designing technology with romantic relationships in mind, participants shared their experiences of times that they regretted the creation of digital possessions from their relationships, and their lack of options for managing those digital possessions after their break ups. Natalie-28 and her ex-partner graduated on the same day, and it was an opportunity for their families to meet one another during the celebrations. Inevitably, the day was

documented in photographs that feature a mixture of Natalie-28, her family, her ex-fiancé, and her ex-fiancé's family:

> *"We got together one month before our graduation, so our entire graduation ceremony, there are pictures of me, him, and our families, both families. It's really hard to detangle that."*

Natalie-28's graduation is inextricably linked to her ex-partner; at the time, there was no thought for creating digital possessions that specifically did not include him or his family, because Natalie-28 was not expecting or planning for a future in which they would not be together. Consequently, her break up is made manifest in the digital possessions depicting her graduation.

Charlotte-22 shared a similar experience, albeit from a slightly different perspective. During the last Christmas she and her ex-boyfriend shared together, Charlotte-22 spent time with her ex-partner's family and featured in their photographs of Christmas day. Unfortunately, her ex-boyfriend's uncle was ill at the time, and passed away six months before they broke up:

> *"Before we split up, his uncle was really ill, so I felt guilty that the last time they'd spent with him had me in all their photos. At the time, I didn't know that we were going to break up, because it was like six months afterwards that it happened, but I still feel really guilty about being in those photos."*

Neither Natalie-28 or Charlotte-22 could have known at the time of creation how these digital possessions would be affected by their relationships ending. Although technology supported them in entangling and engaging with their partners during their relationships, the participants had no way to disentangle their and their ex-partners presences from the possessions post-break up.

6.3.5 Summary of Results

Participants shared stories of times that their ex-partners had control over digital possessions from their relationship, and the difficulties caused in terms of managing those digital possessions after their break ups. Access to digital possessions was taken away from participants without warning when ex-partners decided to delete or remove the possessions from previously shared spaces, such as social media. Ex-partners that owned, and therefore had sole control over elements of the curation of, digital possessions, by extension had control over their ex-partner's digital past

and digital identity. One participant even discussed her total lack of control when her ex-partner fabricated digital possessions and shared them with their social circle, in an effort to create issues for her new relationship.

The ways in which digital traces of ex-partners surfaced across various digital mediums were explored as participants shared their experiences of attempting to curate and manage those traces – often in systems that were not designed to be shared between multiple people or to cater for the breakdown of a relationship. Participants highlighted a lack of options in managing and curating these digital possessions, and were affected by system limitations when it came to dealing with the digital traces of their ex-partners.

Managing and curating digital possessions was seen as a way to manage and curate the narrative of a relationship and break up. Participants were aware of the story their digital possessions told in outward-facing contexts such as Facebook or Instagram, and knew that curation in public digital settings was a way of announcing to their social circles their feelings towards an ex-partner. Participants discussed their experiences of curating to maintain a new, platonic relationship with an ex-partner; and to make room for a new relationship; and their experiences of worrying about how an ex-partner would craft their relationship and break up narrative.

Participants shared stories of the times they felt guilt at having made digital possessions during their relationships that were complicated to deal with after their break ups. Again, these participants felt limited by a lack of methods to curate and manage digital possessions in a post-break up context, contributing to feelings of regret and frustration.

6.4 Discussion

There is a clear need for new grammars of action that enable individuals to manage and curate their digital possessions in more meaningful or useful ways than were available to these participants after their break ups.

To guide the creation of these new grammars of action, I created three design dimensions based on the limitations as described in the themes above. In this section I introduce and define the design dimensions of Temporality, Stewardship, and Context, highlighting the participant issues that led to the creation of each.

6.4.1 TEMPORALITY

Digital traces of ex-partners were found in the digital possessions of some participants after their break ups. These participants were unable to manage their digital possessions in such a way that they could specifically curate the traces of their ex-partners. They were limited by grammars of action that only allowed them to curate digital possessions in their entirety. These participants were confronted with a choice between deleting their digital possessions, as in Wilson-23's experience with his Ebay account, or continuing to interact with the digital possessions while ignoring the traces, as in Emma-26's experience with her shared calendar.

In these instances, the participants wanted to curate digital possessions that could not be edited, as a way of removing evidence of their past relationships from those possessions; they wanted to revert their digital possessions to a pre-relationship state. Although individuals create digital possessions as part of entering into and maintaining a relationship, this research shows that being in a relationship also alters digital possessions that an individual already owns. Curation in the context of time could allow individuals to manage digital possessions that cannot be curated by any other means, such as reverting a digital possession to the state it was in before they met their ex-partner, or even managing a collection of digital possessions based on time periods.

To support the creation of grammars of action that address curating digital possessions in this way, I define the design dimension of *Temporality*. I developed Temporality as relating to the *manipulation of digital possessions and collections of digital possessions in terms of state and time*.

6.4.2 STEWARDSHIP

Although digital content was considered by many participants to be shared between themselves and their partners during their relationships, many of those digital possessions existed in digital space belonging to only one of the individuals. While the participants were still with their ex-partners, the location of those digital possessions did not matter; although neither partner might have had ownership of all the digital possessions, they had access to them and could use them regardless of who actually owned them. However, after their relationships ended, some participants suddenly lost access to digital possessions that resided in a digital space owned by their ex-partner. Not only was access to digital possessions limited

for the participants, but the curation and management of those digital possessions became the province of their ex-partners, rather than the shared experience the participants had become accustomed to during their relationships.

Wilson-23 experienced this when his ex-girlfriend made a unilateral decision to delete a meaningful photograph of the couple from her Facebook, without giving him an opportunity to create his own copy. After her relationship ended, Natalie-28 suddenly realised that her ex-partner was the sole owner of a large number of photographs from their relationship, both on shared spaces like Facebook, but also on private spaces like his laptop. Both of these participants struggled with the idea that their ex-partners could curate these digital possessions without the participants being able to stop them, and also that their ex-partners could choose to keep digital possessions that the participants would rather be deleted simply because these digital possessions resided in spaces controlled by those ex-partners.

In both these instances, the participants wanted to be able to manage and curate digital possessions that they no longer had ownership over. By enabling individuals to create their own copy of digital possessions that reside in a space owned by an ex-partner, those individuals can be supported in curating collections of digital possessions independently from their ex-partners.

To support the creation of grammars of action that support curating digital possessions independently of an ex-partner in this way, I developed the design dimension of *Stewardship*. I describe Stewardship as relating to *the inclusion of digital possessions from an ex-partner's collection in an individual's own collection*.

6.4.3 Context

When it came to creating digital possessions during their relationships, participants were focused on capturing their experiences with their partners, rather than considering how the digital possessions they created would impact the way they remember those important experiences post-break up. As a result, meaningful moments were documented in digital possessions inextricably tied to an ex-partner.

An individual managing and curating their digital possessions after a relationship ended was seen as a way for that individual to craft and control the narrative of that relationship and subsequent break up. While some participants decided to keep digital possessions from their relationships on social media profiles (in order to maintain a good relationship after the break up), others focused on removing any

public-facing digital possessions that connected them to their ex-partner. Ryan-27 found this particularly difficult, discovering meta-data from his ex-boyfriend embedded in digital possessions in the form of Facebook comments on photographs not explicitly connected to his past relationship.

Other participants faced similar issues where the content depicted in digital possessions unrelated to an ex-partner was linked to that ex-partner by other means. As with John-33's experiences of tainted digital possessions in Chapter 4 (Exploring the Experience of Digital Break Up) the digital possessions documenting Natalie-22's graduation day depict her celebrating with her ex-partner and his family; the end of Natalie-22's relationship tainted the digital possessions depicting an experience that was otherwise not related to her ex-partner.

These participants faced issues concerning a lack of control around the content depicted in, and the information connected to, a digital possession. To address this, I developed the dimension of *Context*. I describe Context as relating to the *manipulation of the content depicted in, or the information connected to, a digital possession or collection of digital possessions*.

6.5 Conclusion

In this chapter I documented an exploration of the ways in which technology has constrained participants and let them down in the context of managing digital possessions in the way they wanted after a break up. The research reported on in this chapter contributes to answering the third research question set out at the beginning of this thesis: How can interaction design support the management of digital possessions after a relationship break up?

I analysed 10 semi-structured interviews through the construction of an affinity diagram, subsequently exploring the following themes: Ex-Partners in Control of Digital Possessions, Managing the Digital Traces of an Ex-Partner, Managing Narratives by Managing Digital Possessions, and Consequences of Creating Digital Possessions. My analysis highlighted the need for new grammars of action to deal with issues the participants faced following their break ups, and in considering those issues I developed three design dimensions; Temporality, Stewardship, and Context.

In the next chapter I report on research that explores the use of these dimensions in designing new grammars of action; two design workshops inspire and direct the

development of eight prototype grammars of action, which are subsequently evaluated with 12 participants in one-to-one evaluation sessions.

CHAPTER 7.
TAKING ACTION THROUGH INTERACTION

CHAPTER SUMMARY

In the previous chapter I reported on 10 semi-structured interviews aimed at gathering stories of times when technology had failed people in managing their digital possessions, specifically in ways they wanted, after a break up. Those interviews were thematically analysed, and four themes were subsequently explored around the concepts of control, digital traces, managing a narrative, and the consequences of creating digital possessions.

These themes contributed to the creation of three design dimensions; Temporality, Stewardship, and Context, which form the basis for the final part of this research. In this chapter, I report on two design workshops aimed at creating initial prototype concepts for new grammars of action based on these design dimensions. I document the progression of these concepts through to high-fidelity prototypes and share the results of a final set of 12 interviews focused on evaluating those prototypes.

7.1 Introduction

In the previous chapter I explored the ways in which current technologies limited individuals in how they could interact with digital possessions after a break up. That exploration resulted in the creation of three design dimensions: Temporality, Stewardship, and Context. In this chapter, I report on the process of developing prototype grammars of action specifically designed to support individuals in curating and managing digital possessions in the context of a relationship break up. In order to create these prototype grammars of action I ran two design workshops, comprised of tasks that were informed by my design dimensions.

The design workshops resulted in a series of initial concepts for potential grammars of action, some of which were used as the foundation for subsequent prototyping activities. Eight high-fidelity video prototypes were developed, demonstrating how these new grammars of action might look and work across various digital technologies. I gathered feedback on the prototypes in 12 evaluation sessions with individuals who had each experienced a relationship break up, and had used social media during their relationship.

7.2 Design Workshops

Two design workshops were run with the aim of developing new ways in which an individual might be able to interact with digital possessions from a past relationship after a break up. In this section I summarise the demographics of the workshop participants, outline the procedure of the design workshops, and present the workshop outputs.

7.2.1 Participants

A total of eight individuals participated across two design workshop sessions; five participants in the first, and three in the second. The majority of design workshop participants were in their mid-to-late 20's, and their ages ranged from 21 and 47 years old (with a mean age of 28 years old). The majority of the participants were female, with only one male participant taking part in the second session.

These participants were recruited through posters advertising the study in coffee shops and cafes in the city centre, as well as through posts on Facebook and Twitter.

7.2.2 PROCEDURE

Two design workshops, each lasting 90 minutes, were held with the aim of developing new concepts for grammars of action to support people in managing and curating their digital possessions after a relationship break up. The workshops revolved around supporting a fictional persona, Stacey, in how she could manage or interact with her digital possessions after breaking up with her fictional partner, Dave.

The participants were welcomed to the workshop and given an overview of the task they would be working on: proposing new ways of interacting with and managing Stacey's digital possessions by changing and rearranging physical representations of those digital possessions.

To guide their work, the participants were introduced to the three design dimensions of Temporality, Stewardship, and Context. Each dimension was presented in informal terms to the participants, with simpler names and descriptions which aligned with the academic definitions documented in the previous chapter. These can be seen in Table 5 below.

Design Dimension	Presented as	Description
Temporality	Time Range	The period of time within which an individual can view digital possessions
Stewardship	Sharing Possessions	Whether an individual includes digital possessions belonging to their ex-partner in their own collection
Context	Level of Detail	The amount of information connected to or contained in a digital possession, on a sliding scale from incredibly vague to complete

Table 5: Translation of design definitions to more human-language terms for design workshop participants.

The participants were then introduced to Stacey and her collection of digital possessions. The digital possessions included photos, texts, emails, and posts on social networking sites (Instagram and Facebook), and represented common types of digital possessions that were discussed by participants across the previous research studies. Stacey's possessions were arranged chronologically on tables in the workshop room and were accompanied by a timeline of events beginning with Stacey breaking up with her previous ex-boyfriend (Robert) through to meeting and befriending Dave, the pair becoming partners, and eventually the end of their

relationship. Three digital possessions belonging to Dave were also presented here. This setup can be seen in Figure 6 below.

Participants were each given a sheet of paper with the names and definitions of the design dimensions as well as Stacey's background, to use as reference points throughout the workshop.

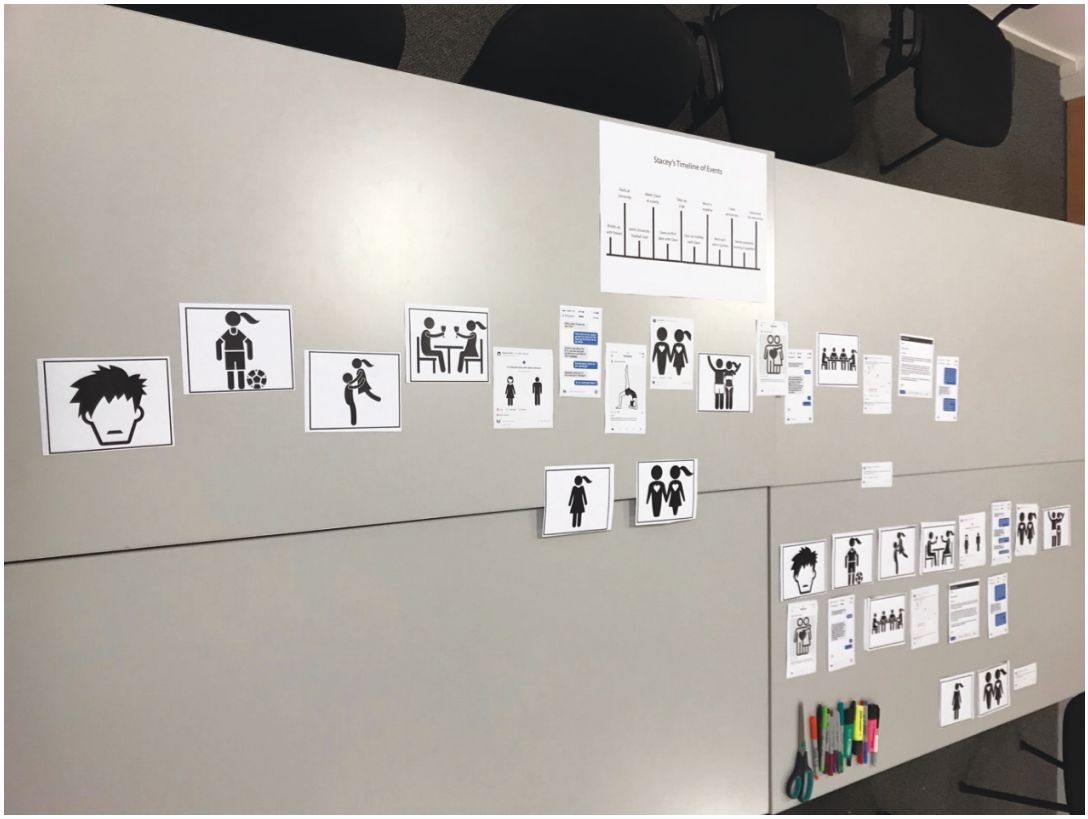

Figure 6: Design workshop setup featuring Stacey's digital possessions.

The tasks participants were asked to complete took the form of seven scenarios, each addressing one or more design dimension to ensure every possible permutation of dimensions was considered when developing the concept interactions. Each of these tasks began with the phrase *'Stacey wants'*, and directed participants towards the dimensions they were supposed to design around. The participants were encouraged to think out loud and discuss the different ways in which they could accomplish their tasks.

Each task and the design dimensions they address can be found in Table 6 below.

Design Dimension(s) Addressed	Task
Temporality	Stacey wants to only see digital possessions from when she first meets Dave, to before she starts to have doubts about the relationship.
Context	Stacey wants the Level of Detail for her digital possessions to be almost as vague as can be, so that looking at these digital possessions doesn't bring back too many painful memories.
Stewardship	Stacey wants to include Dave's digital possessions in her collection.
Temporality and Context	Stacey wants her digital collection's time range to begin after she broke up with Robert, and end after her holiday with Dave. For the Level of Detail, Stacey wants it to be midway between vague and complete. She doesn't want to see all the information, but she wants to see more than the digital possession at its vaguest.
Temporality and Stewardship	Stacey wants to see the digital possessions from when she started at university until the end of her relationship with Dave, including Dave's possessions in her collection.
Context and Stewardship	Stacey wants to manage her collection of digital possessions so that it includes Dave's possessions as well as her own, and where the Level of Detail is close to complete, but not fully so.
Temporality, Context, and Stewardship	Stacey wants to manage her digital possessions using all three aspects. The Time Range should be from when she first met Dave until after their first date, as well as when they went on holiday, until after they met each other's' families. The Level of Detail should be such that Stacey can look back at the digital possessions without having to worry about easily connecting to Dave digitally when doing so, but she would like to include his possessions in the collection

Table 6: The tasks participants were given during the design workshops.

Participants were given pens, sharpies, glue, tape, and scissors, and told to use these tools to edit Stacey and Dave's digital possessions however they wanted to accomplish their tasks. A new set of digital possessions was laid out for each scenario so that participants could edit the collection from scratch for every task. Participants were directed to manipulate the digital possessions without concern for

current technical capabilities or limitations, and to instead focus on achieving Stacey's goals rather than considering how achievable or feasible their interactions might be.

The full session guide for the design workshops can be found in Appendix E.

7.2.3 Results

Even though the participants were asked to manipulate Stacey and Dave's digital possessions along every possible combination of the design dimensions, the concepts developed during the design workshops can be clearly divided into each of the three design dimensions, and as a result are presented in that structure below.

Separate from their conversations around potential concept interactions, participants from the first design workshops discussed the need for an individual to be able to 'undo' any changes they make to their digital possessions when managing or curating them post-break up. One participant prompted this discussion by sharing a personal experience of ending a friendship; while not the same as experiencing a romantic relationship break up, this is another type of ending where a relationship between individuals changes. The participant talked about how, in anger, she deleted all the photographs that referenced her friendship from Facebook immediately following what she thought was the end of her friendship. The participant eventually re-established her friendship, but was unable to recover all the photos she had deleted in anger; a decision she regretted in hindsight, and one that she wished she could undo:

> *"When I was younger, I fell out with my friend – I thought it was the end of our friendship. There were literally hundreds of photos we had on Facebook, and I went and deleted them after. Now, years later, we're best friends, and we've got all of these memories that are nowhere to be found. It's sad, because it's two years of our friendship gone because I decided to delete them on a whim. If I had had some way of storing them and not looking at them, or hiding them, or just managing them a bit better… I wish I could get those photos back."*

As a result of this, the concept interactions described below and the subsequent prototypes based on these concepts, all include an undo feature to account for changing interpersonal relationships beyond a break up.

Temporality

Time Periods

When confronted with any tasks involving Temporality, the participants found that the most effective way to manage the digital possessions in Stacey's collection was to exclude any digital possessions outside of a certain time range. The participants highlighted that Temporality as a dimension would have more of an impact on Stacey's ability to manage and curate her digital possessions post-break up if she was able to set multiple time periods within which digital possessions in a collection would be visible (which they termed 'chunking time'), to allow for a more nuanced selection of possessions that a user might want to see:

> *"Here, she's been getting fit, she's been doing yoga, and here she's been doing stuff for herself. It would be good if we could keep things that happened here and here but leave these bits out. Like chunking time to only show the things we want."*

Random Ordering

Although the participants did not explicitly create any other concepts concerning Temporality, they did discuss a new grammar of action as part of Context that was based around time and chronology. In order to reduce the amount of information available to Stacey about her digital possessions, the participants explored the idea of assigning random order to photos in a feed; they felt that by presenting Stacey's digital possessions to her in a random sequence, she would by default have less contextual information than if she was presented with her digital possessions in chronological order:

> *"I suppose, with photos for example, if you're scrolling through and it's good, good, good, and then this photo was just before it all went downhill, then you expect those bad feelings as you're scrolling through. But if you reordered photos so that the most recent memory wasn't necessarily the first one you see, if you're just scrolling through, then there's no chronological pattern - it would be harder to remember everything about what happened."*

Although the participants generated this concept under the Context design dimension, in an attempt to reduce the amount of information Stacey has about her

digital possessions, I have reported it as part of Temporality because it connects strongly with the notion of time.

Stewardship

Inclusion and Exclusion

The participants devised a single binary strategy to manage the digital possessions in Stacey's collection when it came to Stewardship. When Stacey wanted to manage and curate Dave's digital possessions with her own, the participants simply included the relevant possessions as required; otherwise Dave's digital possessions were left separate from Stacey's collection. The participants discussed Stewardship and its usefulness, and came to the conclusion that this dimension would be most effective if an individual was able to selectively include digital possessions from an ex-partner's collection in their own, rather than adopting an 'all-or-nothing' approach:

> *"It would be good if you could decide what you want to include of his, instead of just all or nothing. To have a choice of what's important to you instead of just all his stuff."*

The participants discussed the impact it would have on Dave's digital possessions if Stacey was to curate or manipulate them in some way after including them in her collection. It was seen as beneficial for both personas if copies of Dave's digital possessions were included in Stacey's collection, rather than the original possessions, so that each ex-partner could curate and interact with the digital possessions independently of one another:

> *"It would make sense for his photos and stuff to be copied over to Stacey's profile, so she would have her own version of the things as well. There would be no link between them."*

Context

The results of the design workshops relating to Context can largely be split into two types of interactions; those that involve curating the content of a digital possession, and those that involve curating the meta-data associated with a digital possession.

Manipulating Context Through Content

Many of the solutions that participants in the first design workshop suggested involved obscuring or replacing content in digital possessions to make an ex-partner or a connection to a past relationship less prominent. These participants discussed the benefits of having access to digital possessions that reminded an individual of negative experiences from a past relationship, despite the likelihood that interacting with those possessions would be an emotionally taxing experience:

> *"We're assuming that she would be hurt if she sees this email, or these photos, but maybe she's having a moment of weakness, and needs to be reminded that there was a reason that she broke up with him. She wasn't happy, and it wasn't all roses… It's important to be able to have that reality check."*

The participants felt that sometimes it was important that an individual could remind themselves of why they broke up with their ex-partner to begin with, and often by manipulating digital possessions in the ways presented below, an individual could lose access to that evidence, and in doing so, lose perspective on their past relationship.

Blurring

Figure 7: Participants' edited versions of digital possessions depicting blurring on photographs, social media posts, and text messages.

Blurring content was suggested as a way of reducing the level of detail in a digital possession; the participants suggested both partial and full blurring of content in photographs, social media posts, and chat histories. As can be seen in Figure 7,

when blurring digital photographs depicting Stacey and her ex-partner, the participants opted to blur out Dave, and leave Stacey untouched. When it came to Stacey and Dave's chat histories, the participants thought that blurring both of the ex-partners' messages was the best way to reduce the Context in the digital possessions, as blurring only Dave's messages would not reduce the Context of a chat history in any meaningful way.

The left-hand image depicts examples of blurring from both design workshops; the first group opted to highlight the sections of Dave's body in the photo that would have to be removed from around Stacey, whereas the second group were less particular about highlighting specific parts of Dave near Stacey that would need to be addressed by the grammar of action. The right-hand image shows a blurred chat history between Dave and Stacey, where both their messages have been affected by the interaction. The participants considered including a timeline along the side of the message thread to allow Stacey to navigate the blurred messages without having to unblur and reveal what they said.

Cropping

In the first design workshop, the participants discussed with one another the irony of how blurring part or all of a digital possession could draw attention to the fact that there is sensitive content that needs to be obscured; that by obscuring upsetting content, an individual would highlight its existence. As an alternative to blurring, the participants suggested *cropping* or completely removing content from digital possessions. They believed this would eliminate links to an ex-partner more completely than blurring could, and avoid changing digital possessions in such a way that draws attention to those changes:

> *"If you just cropped him out of the photo, she wouldn't have that feeling of anxiety, or thinking 'oh, what was it I blurred here?'"*

By cropping parts of a photograph, as seen in Figure 8, an individual would still be able to connect to the events depicted in the photo, without forcing that individual to see specific people depicted in the photo or have the contents of the photo be immediately identifiable. Similarly, the idea of cropping photographs to a thumbnail size was considered a way to reduce the amount of information available to Stacey.

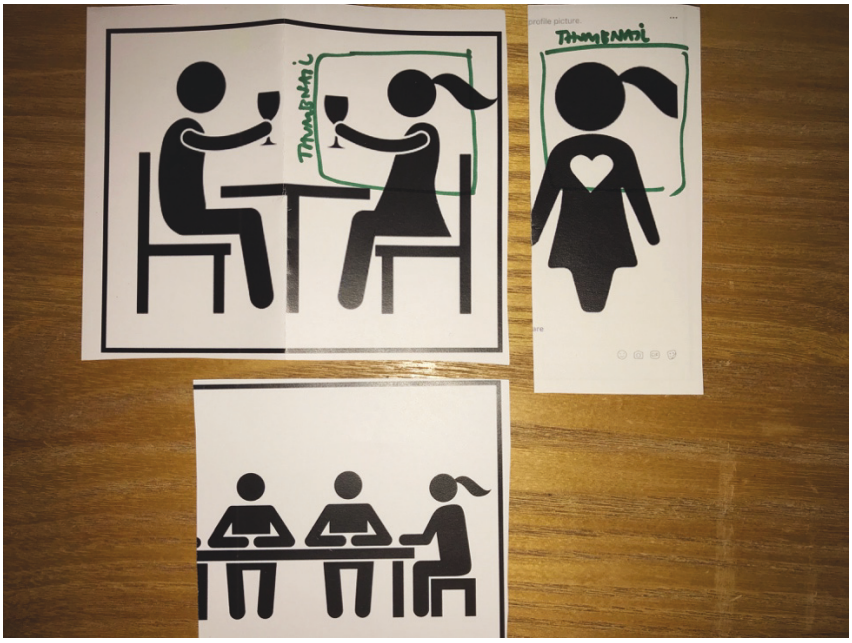

Figure 8: Participant's edits to digital possessions showing cropping and thumbnails.

Replacing

Participants considered *replacing* the content of digital possessions as a way of reducing the level of information presented in a digital possession. This concept was considered by the participants to be a much more light-hearted approach than any of the other concepts they developed. The participants from the first design workshop suggested that it would be fun to have photos of celebrities replace an individual's ex-partner in their photographs, so instead of a photo of Stacey having dinner with Dave on their anniversary, she would instead be sitting opposite a famous actor like Bradley Cooper:

> *"You could put a celebrity in there or something, like replace his face with her favourite celebrity. A wee bit of Bradley Cooper in there! [laughs] It would be comical, kind of, make it fun! Or a muppet, like Kermit or something."*

The second focus group suggested using emoji's to partially supplant an ex-partner in photographs, stressing that it would be a fun way to decrease the Context of a digital possession. Examples of these can be seen in Figure 9 below.

Figure 9: Participants' depictions of how digital possessions might look if Stacey replaced Dave's head or full body with an emoji (left) or a photo of a celebrity (right).

Condensing

Finally, the participants discussed *condensing* digital possessions to reduce the level of detail immediately available to an individual interacting with a digital possession, as can be seen in Figure 10 below. In the context of chat histories and text message threads, the participants suggested either visually '*smooshing'* the digital possessions so that Stacey would have to zoom in to view the content, or collapsing the messages in an accordion-style display, organised into blocks of time, that would have to be expanded in order to be read. Participants also suggested dividing up chat histories into 'conversations' based on times and dates within a chat thread and present them to an individual in a gallery format, so that no information was immediately available; users would have to select a conversation from their gallery in order to read the content.

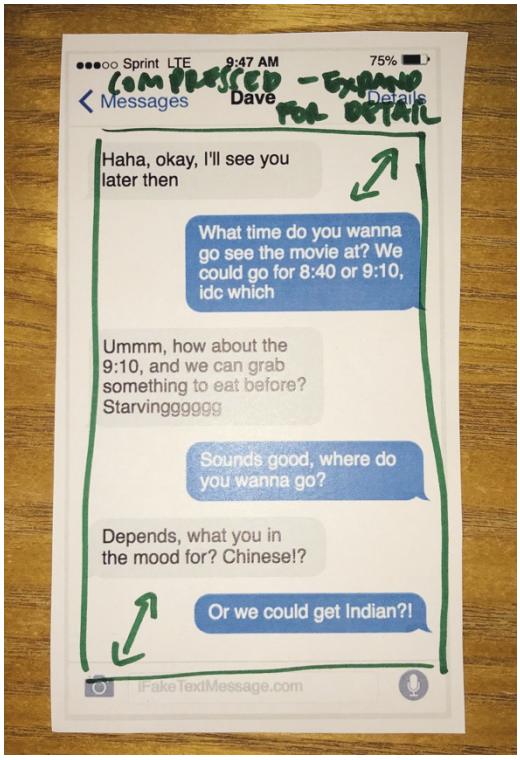

Figure 10: Participant's example of compression.

Manipulating Context Through Metadata

Reducing Information

Participants suggested that Stacey should be able to remove information relating to relationship-focused events from her social media posts; for example, in Stacey's post about an anniversary dinner with Dave, any connection to the anniversary would be removed: '*Anniversary dinner with Dave at Jamie's Restaurant in London!*' would instead become '*Dinner at Jamie's Restaurant in London*!'. Similarly, the participants discussed manipulating Context through removing and reducing metadata from a digital possession:

- Information such as timestamps, geolocation, and creator could be removed from photographs, videos, or audio files;
- Contact names could be removed or replaced in text message threads and chat histories;
- Comments, shares, likes and reactions, and/or tags could be removed from social media posts, or the amount of information reduced (for example, rather than Stacey being told 'Dave, John, and Mary liked your post', the metadata could simply say '3 likes').

This can be seen in Figure 11 below:

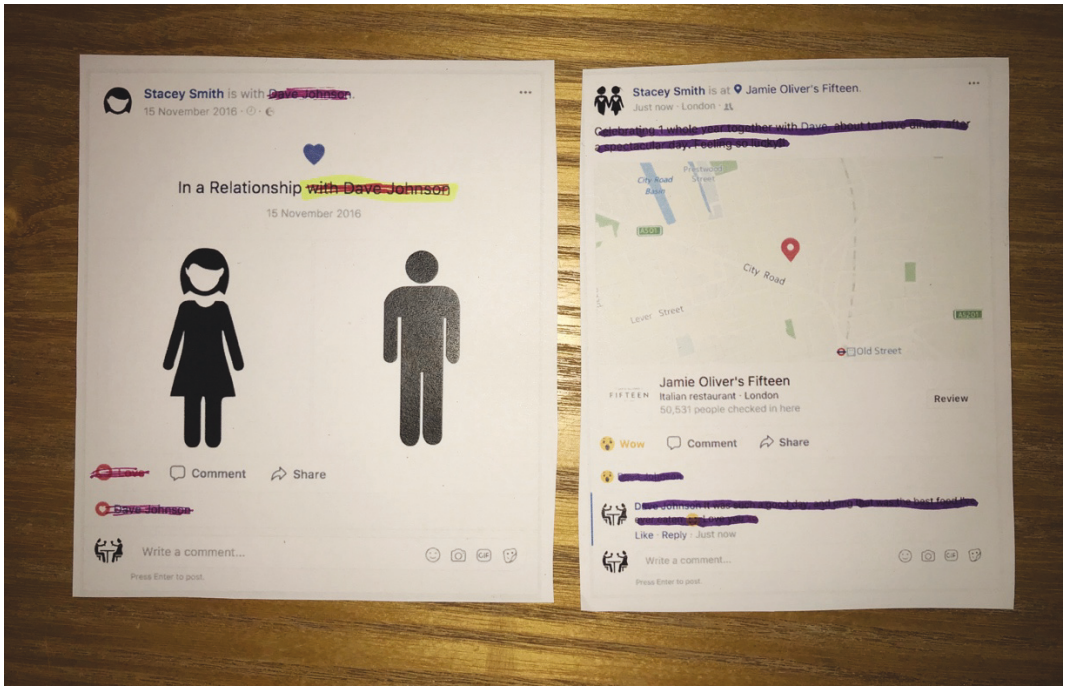

Figure 11: Example of participant's edits to digital possessions involving metadata.

Some of the interactions the participants suggested when it came to manipulating the level of detail in a digital possession's Context focused on manipulating that digital possession's metadata. In order to slightly reduce the Context of Stacey's collection of digital possessions, the participants rearranged the digital possession in two ways; the first was to simply mix the chronological order of the digital possessions, presenting them in a non-linear timeline that confused the overall Context of the collection. The second was to present the digital possessions grouped by file type, rather than by date, again with the same outcome.

Adding Information

Finally, the participants considered an interaction where Stacey could add additional metadata to digital possessions using a traffic-light-style system. She would be able to tag digital possessions as 'safe' or 'unsafe' or use smiley faces or emoji's to foreground the nature of the content without having to view it in future:

> *"Maybe we could highlight that this image contains sensitive stuff, like a warning or something. Maybe like red is highly sensitive, orange is kind of sensitive, and green is okay?"*

The participants also thought it important that this additional metadata be editable; they felt that Stacey would need to be able to change the status of a digital possession from ‘safe’ to ‘unsafe’ as time passed and her attitudes towards the possessions changed. Again, the participants’ example of this can be seen in Figure 12 below:

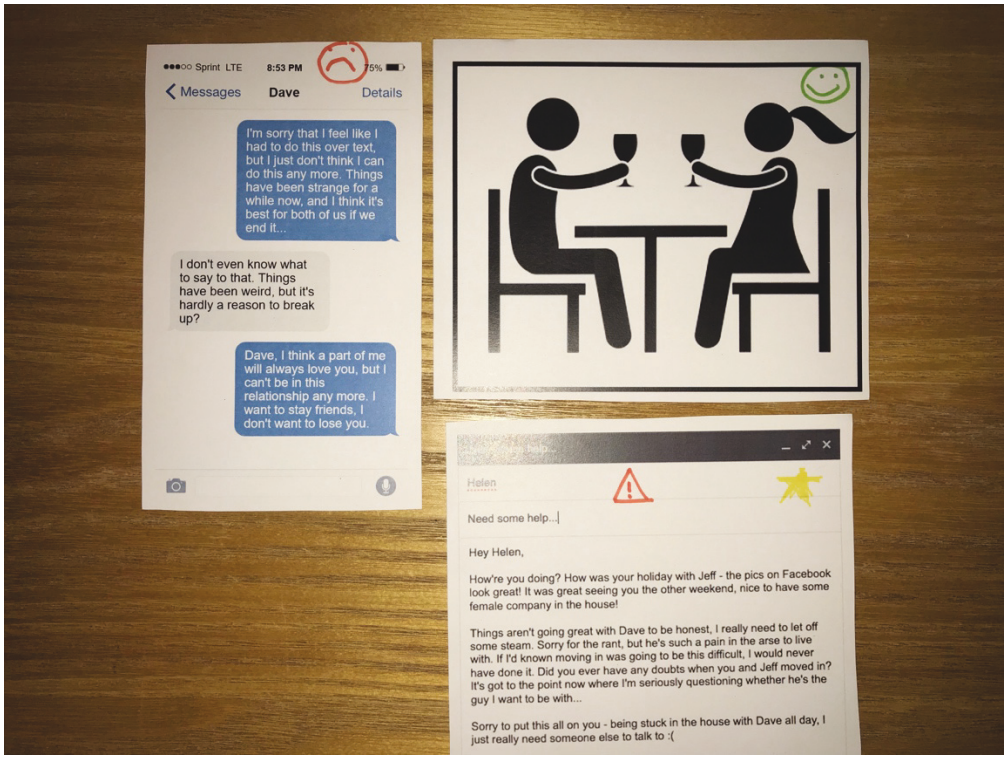

Figure 12: Example of participant's edits to digital possessions showing a meta-tag warning system based on the nature of a digital possession’s content.

7.2.4 Summary of Results

The majority of the concepts from both workshops fall within the Context dimension, with participants only developing a single concept around Temporality and a single concept around Stewardship. There are a few potential reasons for this. In the case of Stewardship, it became easy for the participants to think of think of the design dimensions as a binary constraint, resulting in a simple on/off method of interaction: the participants either included Dave’s digital possessions in Stacey’s collection, or they left them out.

In the case of Temporality, the participants thought only of how it could be applied to digital possessions as a single entity, or to collections of digital possessions. Upon reflection, this is a limitation of the setup of the design workshop: when the design dimensions were translated into simpler terms to facilitate fast participant

understanding in the workshop sessions, the description for Time Range may have been too prescriptive. As a result, it became easy for participants in the design workshops to only explore Temporality through filtering digital possessions in a collection by time.

Context as a design dimension, however, was easier for the participants to related to the content and meta-data of a digital possession. There are more opportunities to be nuanced in manipulating and curating parts of a digital possession than there are when considering a digital possession as a single entity, or considering a collection of digital possessions. As a result of this, the concepts generated with Temporality and Stewardship in mind are more practical, while the concepts relating to Context are richer and more nuanced.

The eight concept interactions identified through the design workshops were setting time periods, inclusion and exclusion, blurring, cropping, replacing, condensing, reducing information, and adding information. I used each of these concept interactions as the basis for developing eight prototype grammars of action, which are presented in the next section.

7.3 Prototyping

In this section, I report on the process by which I developed eight high-fidelity prototype grammars of action based on the eight concept interactions from the design workshops. Each concept interaction was given a prototype name and description, which informed the development of paper prototypes, which in turn informed the creation of high-fidelity video prototypes. Each stage in this process is documented below.

7.3.1 Prototype Names and Descriptions

I started developing the concept interactions into prototype grammars of action by writing descriptions of each prototype based on the discussions of the workshop participants and their concept interactions. I gave each prototype a name based on that description; where the concept name remained relevant, the prototype it was based on kept that name. Where a prototype description prompted a more appropriate name, a new prototype name was given. These names and descriptions can be seen in Table 7 below.

These prototype descriptions, combined with the concept interactions, were used to sketch paper prototypes that storyboard the functionality of each new grammar of action. These paper prototypes are presented in the next section.

Concept Name	Prototype Name	Prototype Description
Blurring	Blurring	Select digital possessions or parts of digital possession to be obscured by blurring. This can be temporarily reverted so that you can see the digital possession in its original state, but will return to its blurred state afterwards.
Cropping	Cropping	Select part of a digital possession to remove from that digital possession. The remaining content will compensate for the removed content by filling the empty space.
Replacing	Replacing	Replacing an ex-partner's face in a digital possession with an emoji, celebrity, or fictional character.
Condensing	Condensing	Select messages in a chat thread to condense into a small space within that thread. This can be temporarily reverted so that you can see the messages in their original state, but will return to its condensed state afterwards
Reducing Information	Hiding Information	Setting meta-data on social media posts such as likes, comments, tags, or shares, to be hidden from you. The changes you make will only apply to you; other users will continue to see the original post.
Adding Information	Adding Custom Tags	Create and apply customised meta-data to digital possessions to create new categories of information by which a collection can be sorted or organised.
Setting Time Periods	Setting a Time Range	Set a time range within which any digital possessions from a collection are displayed. Any digital possessions that were not created within that time range will not be visible for as long as that time range is enforced.
Inclusion and Exclusion	Importing an Ex's Digital Possessions	Import an ex partner's digital possessions from a publicly available source (e.g. social networking sites) to your own collection. This grammar of action only works on your ex-partner's digital possessions which have been shared with you, or within which you have been tagged.

Table 7: Documenting the development of interaction concepts into prototype grammars of action, summarising concept name, prototype name, and prototype description.

7.3.2 Paper Prototypes

With the concepts taken from the design workshops scoped as prototype grammars of action as listed above, the next stage of their development was to storyboard the interactions generated with the workshop participants on paper. Below are digital sketches of these paper prototypes, documenting all eight grammars of action. The paper prototypes are applied across a range of types of digital possessions: messages; photos; social media posts; and social media profiles.

As the majority of digital possessions across all interviews documented in Chapters 4, 5, and 6 were accessed and shared with me on smart phones, the paper prototypes are designed using a phone interface.

Blurring

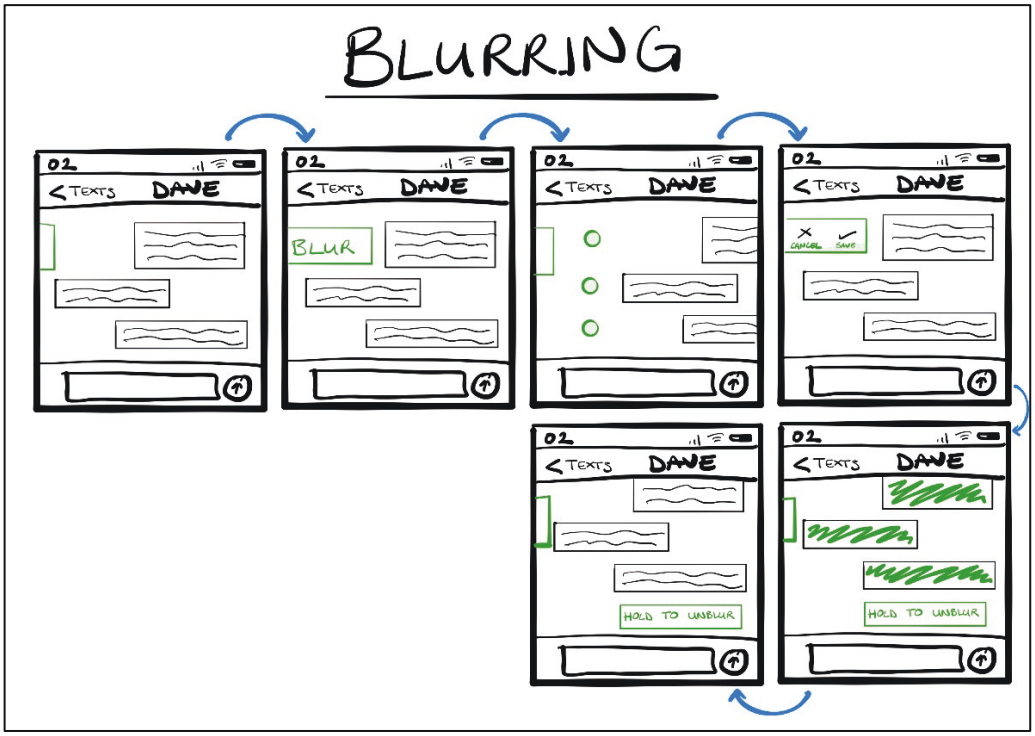

Figure 13: Storyboard of the Blurring prototype.

The storyboard in Figure 13 shows a user blurring text messages from an ex-partner. The user taps on the side bar, revealing the Blur button. When the Blur button is tapped, the user can select texts to mark for Blurring. When all the texts have been selected, the user saves their changes, blurring out the messages so that they are illegible. A button appears at the bottom of the screen, asking users to press and hold in order to unblur the messages. While the user is holding their

finger on the button, the messages are returned to their original state. Releasing the button re-blurs the texts.

Cropping

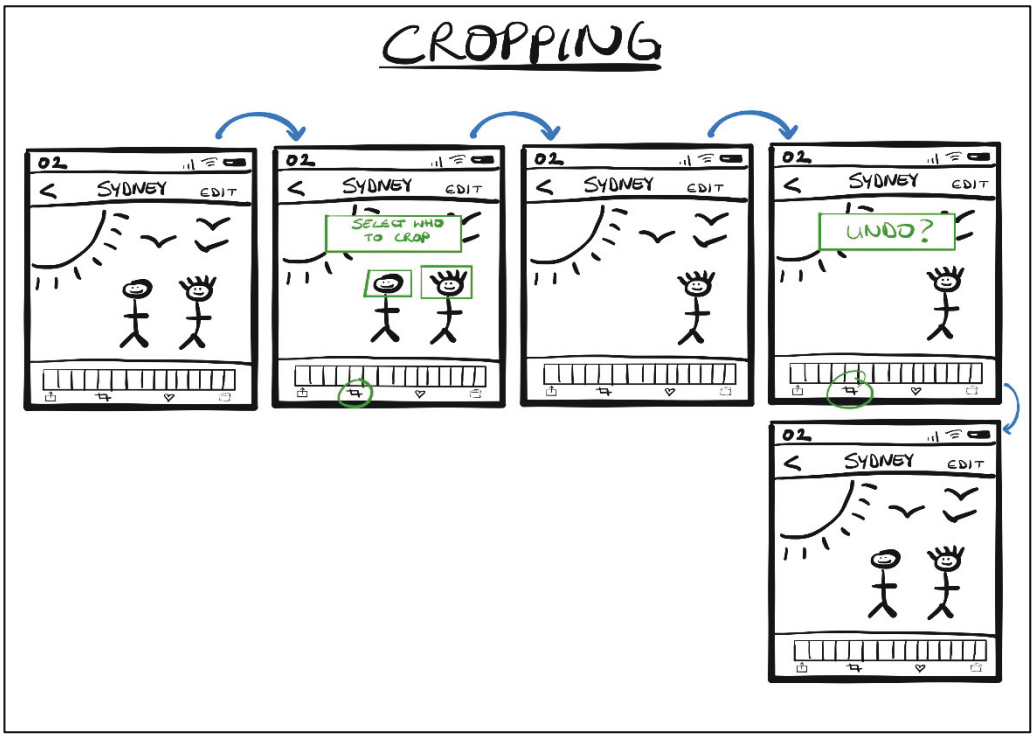

Figure 14: Storyboard of the Cropping prototype.

Figure 14 shows a storyboard for the Cropping prototype: the user taps on the Crop tool while viewing an image, and the people in the photograph are highlighted. The user is presented with an option to select who should be Cropped out of the image; they select their ex-partner, who then disappears, leaving the rest of the photograph unaffected. The space where the ex-partner was is then filled in to match the rest of the photo. When the user taps the Crop tool again, they are presented with the option of undoing the Crop, returning their ex-partner to the image.

Condensing

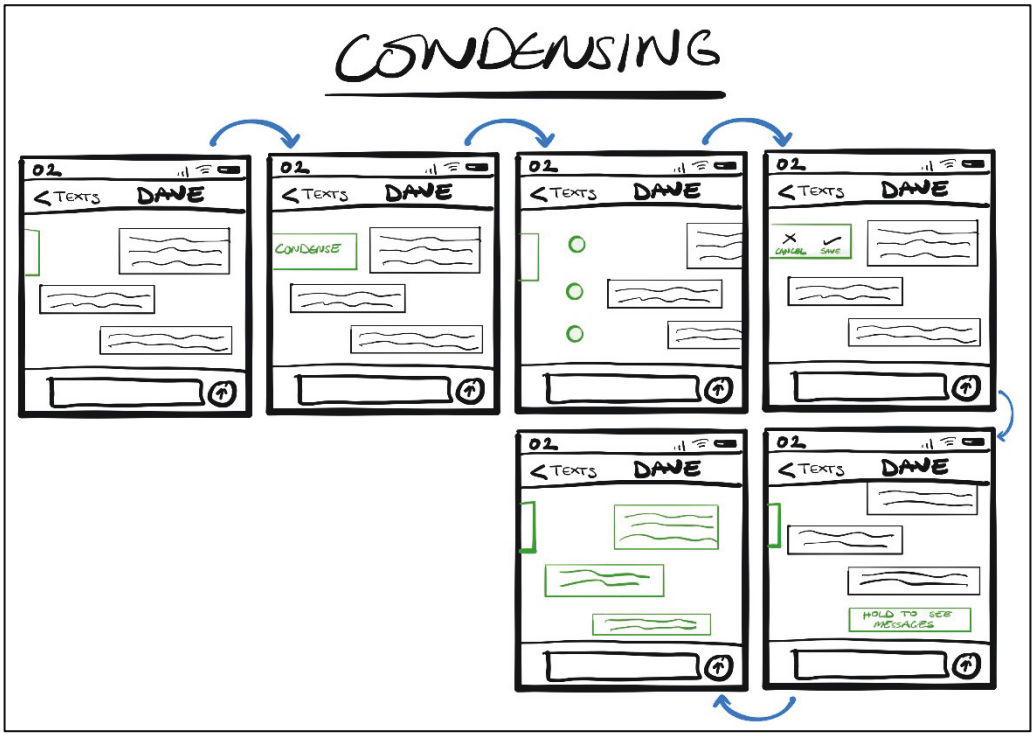

Figure 15: Storyboard of the Condensing prototype.

Figure 15 shows a storyboard for the prototype Condensing. As Condensing and Blurring were based around the same need and idea in the Design Workshops, the storyboard for Condensing is very similar to that of Blurring. When the user taps the sidebar, they are presented with the Condense tool. When tapped, the Condense tool allows users to select messages that they no longer want to see by default in the message thread. Once they save their changes, the condensed messages are moved into the same physical space and covered by a button instructing users to hold their finger on it to see the condensed messages in an uncondensed format once more. When the user holds their finger on the button, their messages return to their original state, and when the user lets go, they get Condensed again.

Replacing

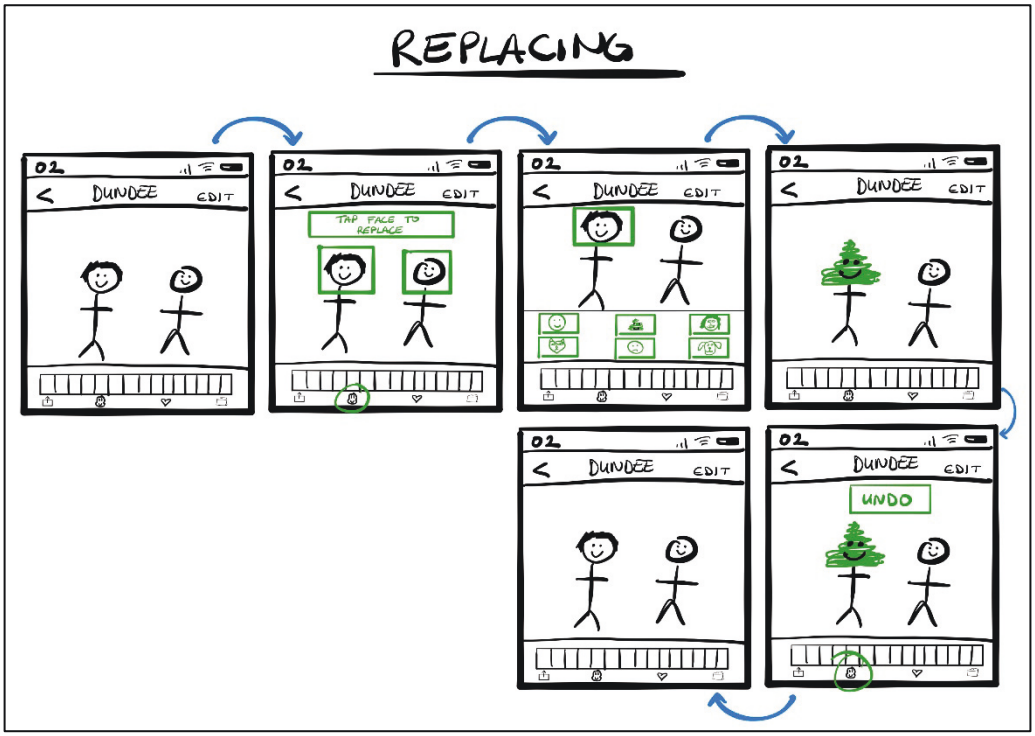

Figure 16: Storyboard of the Replacing prototype.

In the storyboard in Figure 16 a user replaces their ex-partner's face with the face of a celebrity. The user taps on the Replace tool when viewing a photograph, which highlights the faces in the image that can be replaced. Once the user selects a face to Replace, they are presented with a variety of options: celebrity faces, emojis, or cartoon characters' faces. In the storyboard, the user selects a celebrity face to replace the face of their ex-partner. If they tap on the Replace tool again, they are given the opportunity to undo the Replace and restore the photograph to its original state.

Adding Custom Tags

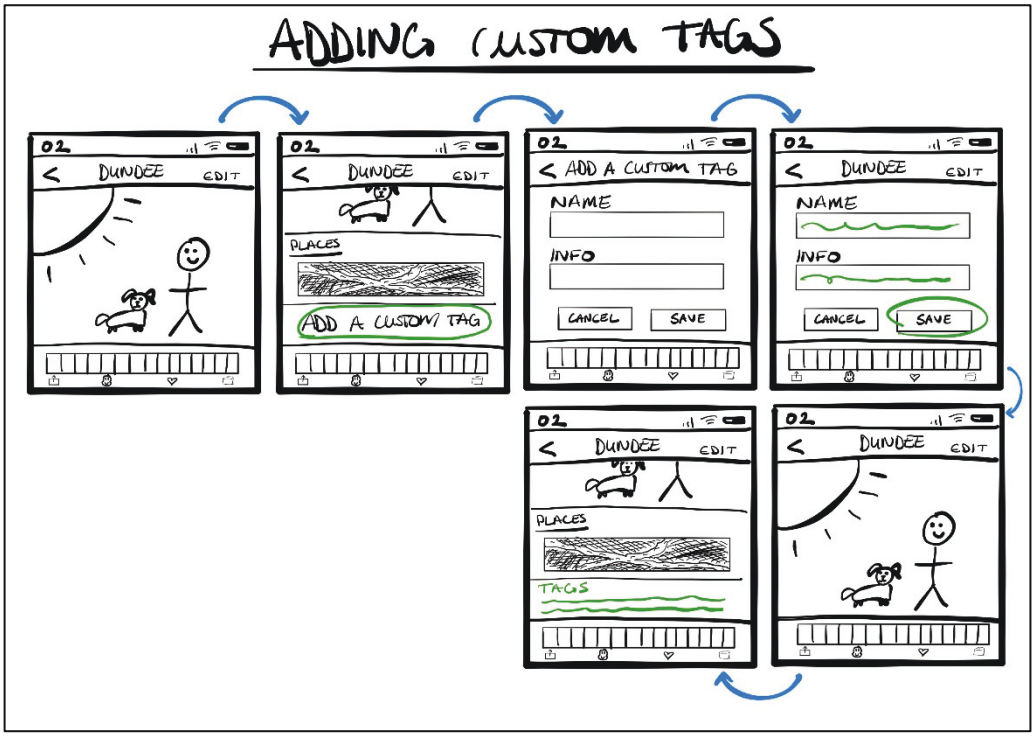

Figure 17: Storyboard of the Adding Custom Tags prototype.

Figure 17 shows a storyboard for the Adding Custom Tags prototype. When using an image app to view photographs, users can see meta-data automatically generated by their phone relating to the image. Typical examples of this meta-data are image size, quality, where the photo was taken, and, if the app detects a face in the photo, who those people might be. When a user is viewing the meta-data for an image, they are given the option to add their own custom information to it. Tapping on the Add a Custom Tag button allows users to choose a name and information for custom meta-data; for example: “Anniversary Celebrations” as a name, and “Second anniversary” as information. After entering the name and information then tapping save, the user is returned to their photograph. Scrolling down to view the meta-data, they can see the custom tag they have added to the image.

Hiding Information

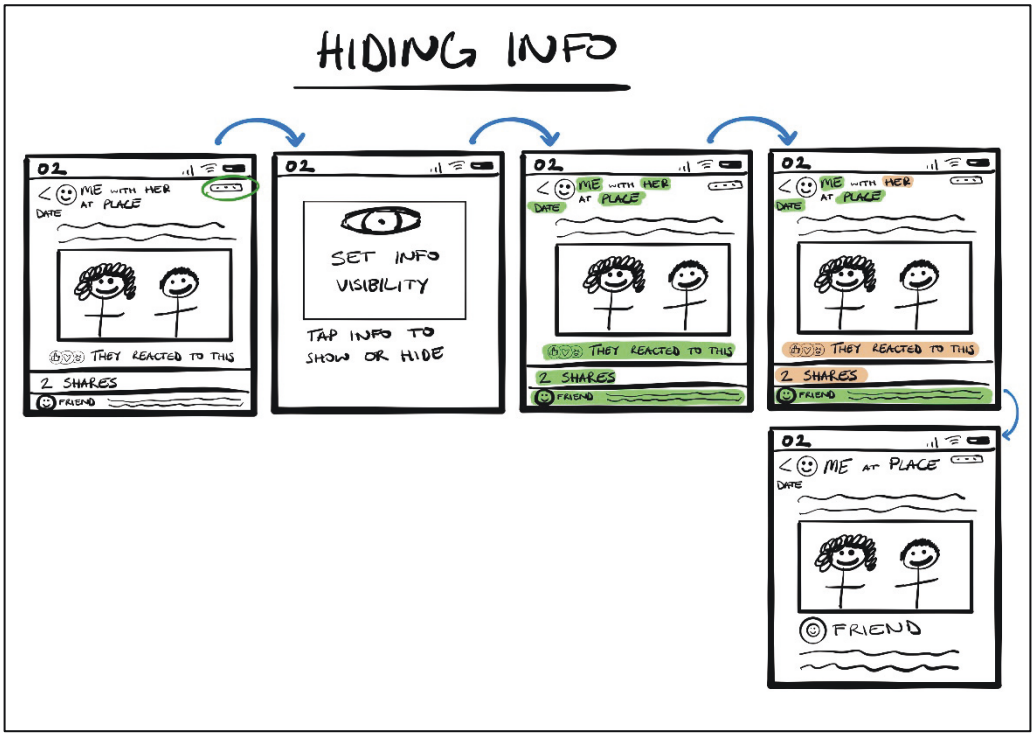

Figure 18: Storyboard of the Hiding Information prototype.

Figure 18 shows the storyboard for the Hiding Information prototype. When viewing a post on their Facebook profile, the user taps on the options button, revealing the Set Information Visibility tool. After selecting the tool, the user is returned to their post, with the content and meta-data of the post highlighted to them. The user taps on the meta-data they no longer want to see, selecting their ex-partner's name, the likes associated with the post, and the number of shares the post has had. They choose to leave their own name, the place associated with the post, the date it was posted, and the comments alone. After saving their changes, the name of their ex-partner, the post's likes, and the post's shares, are no longer visible to the user, but remain in their default state for other users.

Setting a Time Range

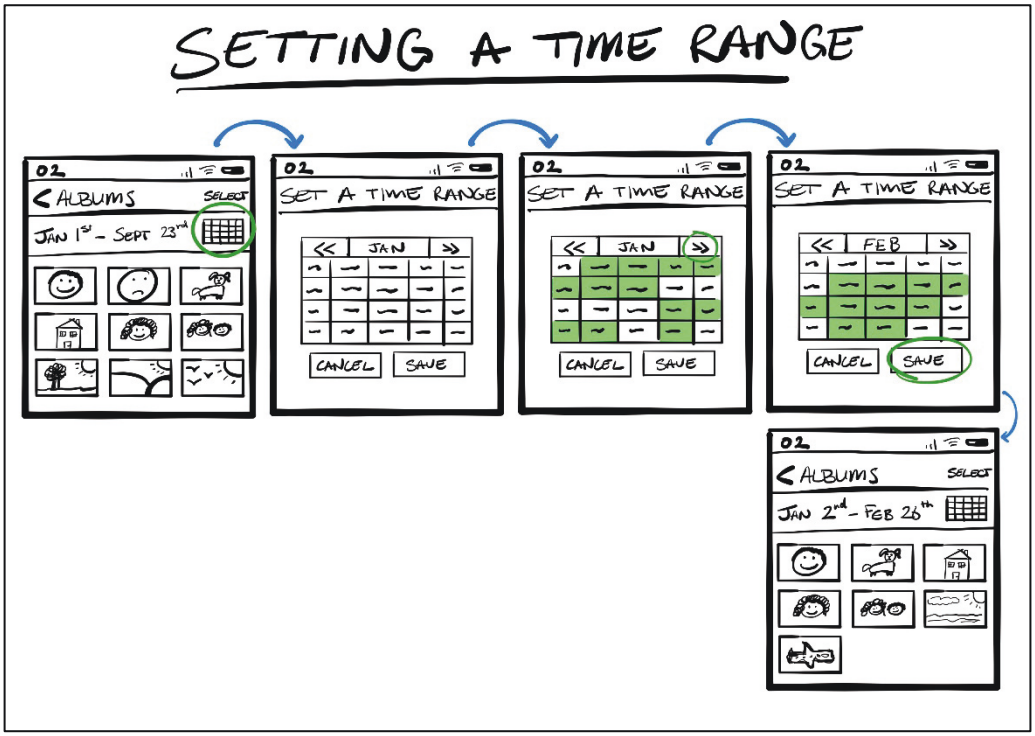

Figure 19: Storyboard of the Setting a Time Range prototype.

The storyboard in Figure 19 sets out the prototype for Setting a Time Range. When viewing a collection of images, such as an album, or images within a certain set of dates, a user is presented with the Set a Time Range button. After tapping the button, the user is brought to a calendar screen, where they choose the dates from which they want to see images; after they save their time range, any images that were created on dates left unselected are not visible to the user when they return to their collection.

Importing an Ex's Digital Possessions

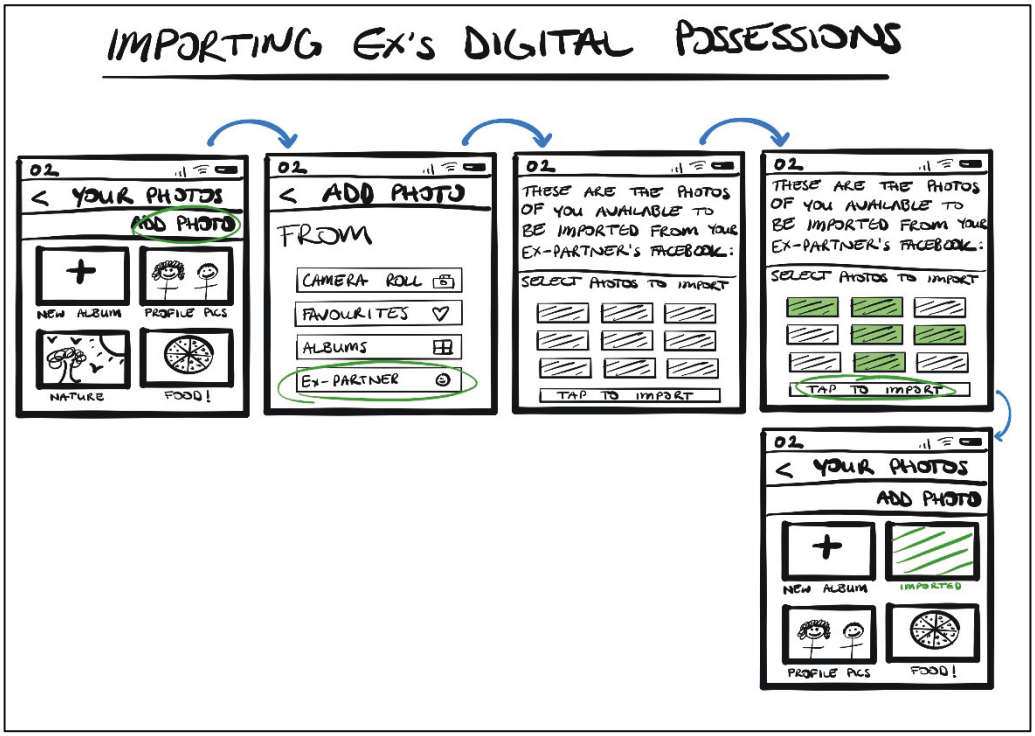

Figure 20: Storyboard for the Importing an Ex's Digital Possessions prototype.

Figure 20 shows a storyboard for the Importing an Ex's Digital Possessions prototype. The user views photos on their Facebook profile, where they tap on the Add Photo button. A menu opens where the user can select a source from which to add photographs to their profile, including from their ex-partner's profile. Tapping on the ex-partner option brings the user to a list of all the photographs they have permission to view from their ex-partner's Facebook profile, which were (a) were taken during their relationship and (b) have the user tagged in them. The user is then able to select photos from this list to import to their own profile. When they tap on the Import button, the photos are added to a hidden album on the user's profile.

7.3.3 High-Fidelity Prototypes

The next stage of the prototyping process involved the creation of high-fidelity video prototypes in Origami Studio[15], which is a tool used to create prototypes based on image assets with pre-defined logic and transition flows. These prototypes showcased the different ways in which individuals could interact with their digital

[15] https://origami.design/

possessions through these new grammars of action. The video prototypes are available to view online through links that can be found in Table 8 below.

Figures 22 and 23 below shows screenshots of prototypes in Origami Studio. The preview screen on the left of each screenshot shows what the prototype looks like, and the coloured blocks on the grey background are the logic and transitions that control the interactions. Figure 21 shows the logic for the Blur prototype. This was relatively simple, with the most complex logic simply toggling the visibility of images to create the blur effect. Figure 22 shows the logic for the Cropping prototype, which was much more complex than that of Blurring, as a result of it controlling more complex animations and interactions.

The majority of the image assets used in the prototypes were screenshots from my own photos and social media accounts. Screenshots of text message threads were created in Photoshop, and any images not taken from my own collection were downloaded from royalty-free image site Unsplash[16].

Figure 21 below shows a screenshot of the final video output of the Hiding Information prototype. The videos show a cursor interacting with the prototypes on a phone screen, fully depicting the grammar of action.

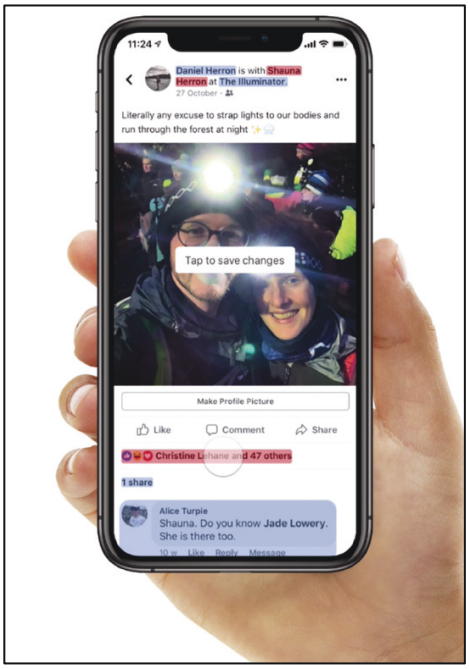

Figure 21: A screenshot of the Hiding Information prototype video.

[16] www.unsplash.com

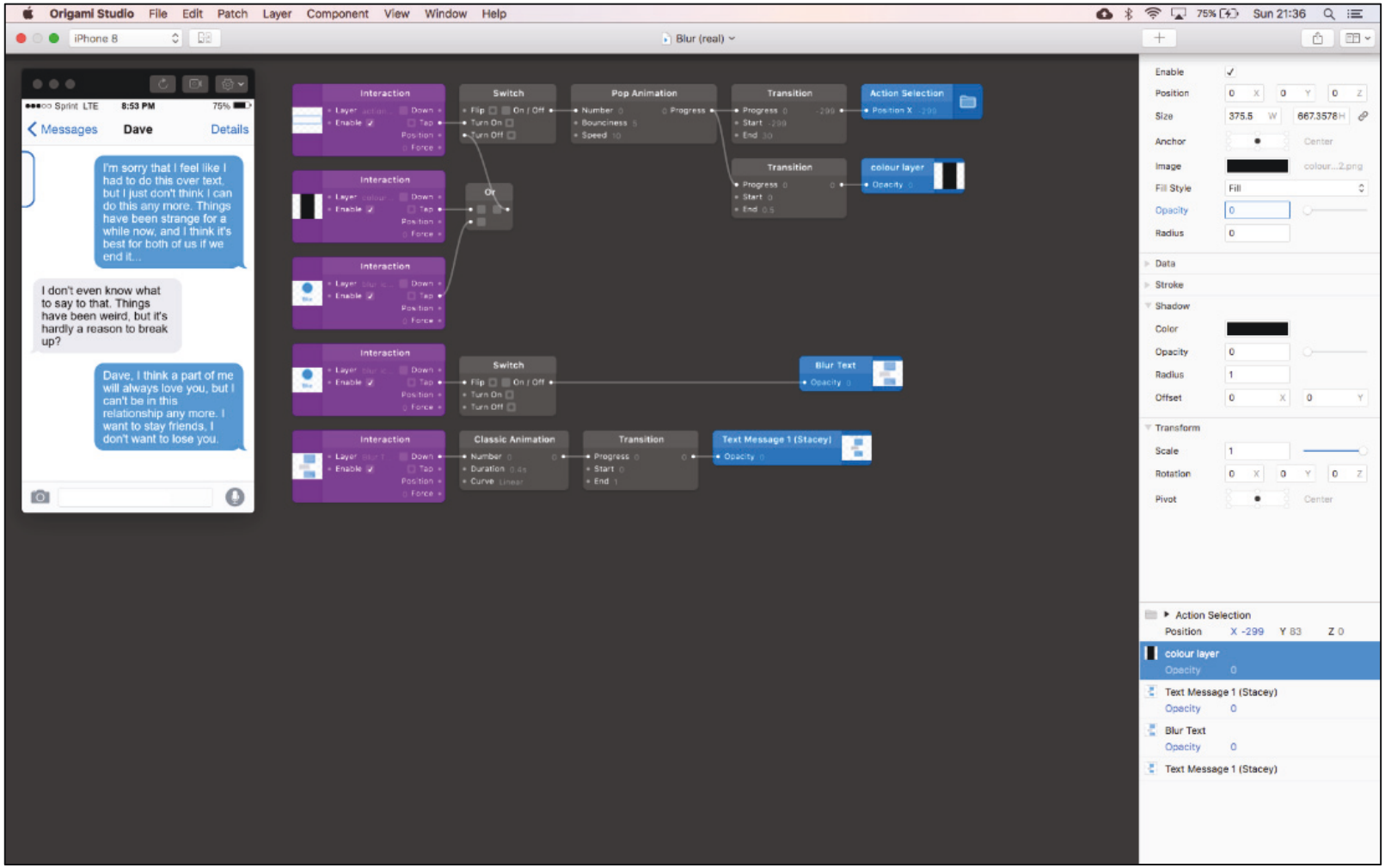

Figure 22: A screenshot of the Origami Studio file for the Blurring prototype.

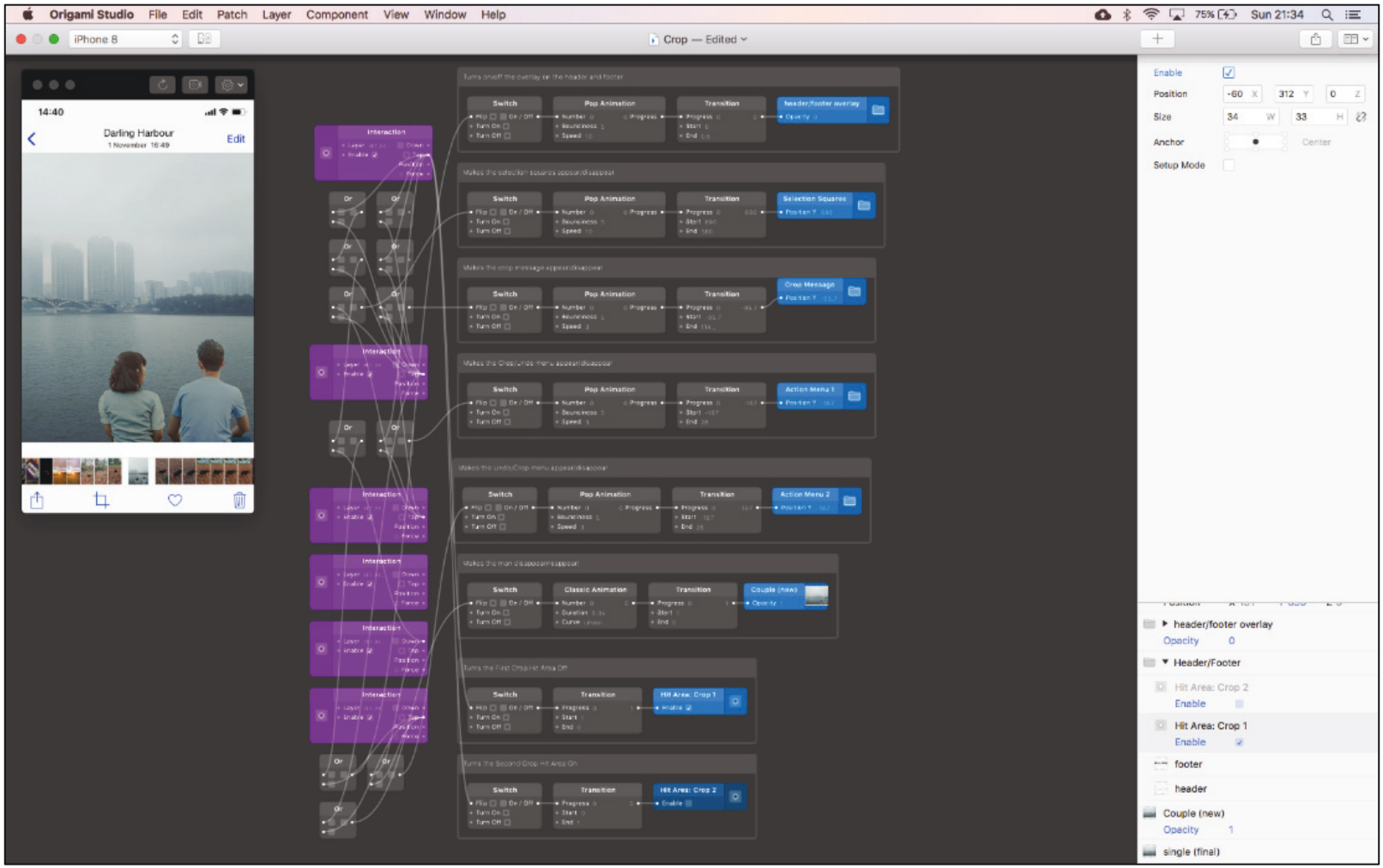

Figure 23: A screenshot of the Origami Studio file for the Cropping prototype.

To see each prototype grammar of action in full, see Table 8 below. It contains a link to the video file for each prototype, which can be streamed online or downloaded and played on laptops, phones, or tablets.

Prototype	Video Link
Blurring	https://bit.ly/2JesliF
Cropping	https://bit.ly/2J1hQk1
Condensing	https://bit.ly/2Ynrxyt
Replacing	https://bit.ly/2Njt6MG
Adding a Custom Tag	https://bit.ly/2XzsGpx
Hiding Information	https://bit.ly/2FI1N8F
Setting a Time Range	https://bit.ly/2JhdjZo
Importing an Ex's Digital Possessions	https://bit.ly/2YnicGN

Table 8: List of each prototype grammar of action and a link to the prototype video file.

7.4 Evaluation Sessions

Following the creation of the high-fidelity prototypes, one-to-one evaluation sessions were run with 12 participants to gather feedback. In this section I will outline the procedure for these evaluation sessions, summarise the demographics of the participants, and review their feedback for each prototype.

7.4.1 Procedure

12 participants were invited to take part in one-hour long individual evaluation sessions. These sessions were mostly focused on gathering feedback for each of the eight prototype grammars of action, but some time at the start of each session was dedicated to setting context for the research and building a rapport with the participants by asking them questions about a past relationship that ended in a break up, separation, or divorce. Open-ended questions such as *'Can you tell me a bit about your relationship? How you met; how long you were together; and what the relationship was like?'*, and *'Can you tell me a bit about your break up? What happened; who broke up with who; are you still in touch?'* were asked.

The majority of the sessions focused on gathering feedback on each prototype grammar of action. For each one, participants were shown the video prototype and given an explanation of the interaction, then shown the video a second time, before

getting asked a series of questions. This process was repeated for each prototype, and the questions were as follows:

- What is your initial reaction to the <prototype name>?
- What benefits can you see to <action> a digital possession like this?
- What drawbacks are there to using <prototype name>?
- What do you think of the name of this interaction?
- If you could change one thing about <prototype name>, what would it be?
    - Is there anything else you would change?

The sessions ended with participants being asked some follow-up questions, such as: which of the prototypes they thought was the most useful and why; and were there any features or interactions they would have liked to see, but which were not included in the prototypes shown to them.

A full interview guide for these evaluation sessions can be found in Appendix E. The mean time for these sessions was 54 minutes and 49 seconds (shortest session was 38 minutes and 21 seconds, longest session was one hour, six minutes, and 41 seconds).

7.4.2 PARTICIPANTS

The inclusion criteria for participants who took part in the evaluation sessions was that they had broken up with an ex-partner, and that during the relationship actively used social media. This was to ensure that anyone evaluating the prototypes had experience with the end of a romantic relationship, and that the romantic relationship had digital possessions associated with it. No exclusion criteria were set around gender or sexual orientation; the only exclusion criterion was that potential participants be aged 18 or older. The participants were recruited through posters put up in coffee shops and cafes in the city centre, as well as through posts advertising the study on Facebook and Twitter.

Seven of the 12 participants were female, and the remaining five were male. The majority of the participants (n-10) were in their 20's, but participant ages ranged from 20 to 56 years old (with a mean age of 28.8 years old). Two of the male participants (William-23 and Charlie-21) were homosexual, with the remainder of the participants identifying as heterosexual. For a summary of each participants' age, gender, sexuality, and information about their past relationship and break up, see Table 9 below.

Participant	Gender	Age	Relationship Duration	Time Since Break Up
Austin-23	Male	23	1 year	2 years
Jacob-28	Male	28	7 years	1 year
Sandra-56	Female	56	38 years	11 months
William-23	Male	23	6 months	3.5 years
Hannah-25	Female	25	6.5 years	5 years
Emma-28	Female	28	5 years	5 years
Mary-50	Female	50	16 years	2 years
Jessica-23	Female	23	1.5 years	1.5 years
Victoria-27	Female	27	2 months	8 years
Ella-22	Female	22	2 years, 2 months	1 month
Sam-20	Male	20	3 years	2.5 months
Charlie-21	Male	21	5 months	7 months

Table 9: A summary of participant demographics for the evaluation session participants.

7.4.3 Results

In this section, I report on the results of the evaluation sessions aimed at gathering feedback for each prototype grammar of action. Each prototype is reported on in turn, highlighting the prevalent feedback across all participants, as well as any feedback conflicting with the majority, and any potential improvements to the grammars of action as suggested by the participants.

Blurring

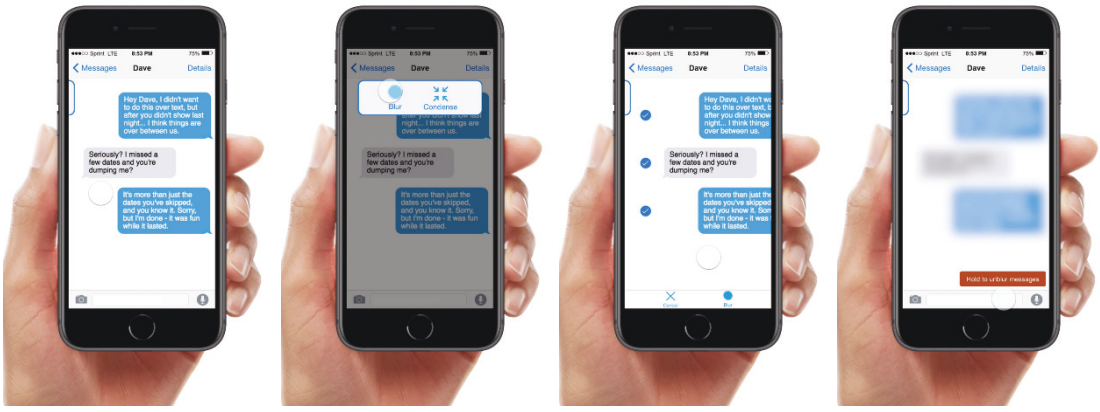

Figure 24: Stills taken from the Blurring prototype video.

To see the prototype video for the Blurring grammar of action, click here or follow the link in Table 8 above.

The majority of the participants did not find Blurring to be a particularly useful way of managing their digital possessions after a break up; of the 12 participants, only three said that they would use it themselves if it was available to them after a break up. The most prevalent critique of Blurring was summarised succinctly by Charlie-21:

> *"I think that Blurring might almost defeat the point of Blurring. I guess the point is to hide messages you don't want to see, but by having them blurred, it would draw the eye. I think it might almost lead your attention to it instead of allowing you to move on."*

Four participants (Jacob-28, Mary-50, Ella-22, and Charlie-21) felt that by Blurring messages to reduce opportunities to interact with them, those message would be given a 'special status' as a result, and would attract attention simply by the nature of their new appearance in comparison to the majority of messages in a thread.

Beyond feeling that blurred messages would attract his attention, Jacob-28 worried that the blurred messages could act as a memory cue and prompt individuals to remember the negative experiences that Blurring aimed to distance them from:

> *"I think Blurring invites these messages to take a special place in your memory, and it makes it almost too easy to go back and look at things that you didn't want to look at."*

Part of the proposed value of Blurring is that it acts as an intermediate step between keeping a digital possession and deleting one. However, it became clear in the feedback from two participants (Mary-50 and Victoria-27) that not everyone saw value in this kind of half-way measure curation:

> *"For me, if it's a text you don't want to see, delete it. Seeing it here but blurred, every time I'd think 'Oh yeah, that's blurred because it hurts.' If it's not there it's not a reminder of the pain."*

Where Sas and Whitaker might class Mary-50 and Victoria-27 as Deleters (Sas & Whittaker, 2013), Emma-28, who felt entirely the opposite, would fall into the category of Keeper. Emma-28 did not want to delete her digital possessions and

saw value in Blurring because it created a similar outcome to deleting a digital possession, but without the permanency of deletion.

> *"I don't see any downside to Blurring, because you don't lose anything. You don't lose the messages, you don't lose the context, it's just decided I don't want to see this anymore."*

Participants suggested some improvements to Blurring: Jessica-23 wanted to blur her messages for a set amount of time, rather than having the *'Hold to Unblur'* interaction. Her rationale for this alternative Blurring was that it would be more useful to her as a grammar of action if an individual was experiencing distress as a result of fixating on their digital possessions after a break up:

> *"Maybe it would be good if I could set a period of time, so if I want to blur those messages for 24 hours, and then they'd be available again. It would be good for if you're fixated on the messages, to make them unavailable no matter what."*

Another suggestion came from Charlie-21, who thought that the *'Hold to Unblur'* button stood out from the messages in the text thread so much so that it drew too much attention. He believed that by changing the colour of the button from orange to blue, to match the texts on the screen, it would encourage people to unblur their digital possessions less. As has been documented in previous work (Fox & Tokunaga, 2015), reduced opportunities to view digital possessions after a break up contribute to more positive wellbeing, giving Charlie-21's suggestion merit.

Cropping

Figure 25: Stills taken from the Cropping prototype video.

To see the prototype video for the Cropping grammar of action, click here or follow the link in Table 8 above.

The overall reaction to Cropping was fairly mixed. Of the 12 participants, seven reacted more negatively than positively, but every participant could see value in being able to crop an ex-partner out of a photograph; even if it was not something that they wanted to do themselves. Four participants (Austin-23, Jacob-28, William-23, Sam-20) had concerns around Cropping in that they felt the connection between themselves and their ex-partner would remain intact even in cropped photographs. Austin-23 commented:

> *"If you have a memory with someone, by cutting them out of it, it doesn't just disappear. The photo is just the thing you see, Cropping isn't going to erase that memory."*

For those participants, Cropping was seen as a way of falsifying the past, rather than facing the reality of a difficult break up.

Eight of the participants saw value in Cropping as a way of preserving digital possessions in which the focus was on places or events, rather than a past relationship. Mary-50 summed up the participants' views in this regard:

> *"Cropping could be useful because there are places that I remember with fondness, but I don't always remember him with fondness! If I could take him out of those pictures then I would still have memories of the place, but not necessarily that reminder of him."*

Theses participants are referring to tainted digital possessions as discussed in Chapter 5 of this thesis; photographs documenting special places, events, or experiences that are difficult to interact with post-break up due to the presence of an ex-partner in the digital possession. By removing the ex-partner, these participants felt that they would be able to focus on the remaining aspects of their digital possessions, allowing them to interact with them again.

Two participants, Sandra-56 and Hannah-25, highlighted the potential positive short-term impact Cropping could have on their experience of breaking up. Cropping could allow individuals to create space from their ex-partner temporarily, then revert the changes once they feel better equipped to deal with the digital possessions:

> *"If I had access to this after my break up, I would have used it all the time, then undone it later when I wasn't so mad and upset."*

These two participants did not see Cropping as a permanent method of managing their digital possessions; Sandra-56 in particular felt uncomfortable at the prospect of creating a false history using this grammar of action. This emphasises the importance of including a method for individuals to undo any changes they make when managing or curating their digital possessions, as first highlighted by participants in the design workshops that informed the design of these prototypes.

Further, the benefits of a temporary change enacted through the use of this grammar of action suggests that an extension to Cropping could potentially include the introduction of an automated reversion. After, for example, two weeks, a cropped photograph could automatically revert to its original state; this would allow individuals to create space and disconnect from their ex-partner, while eliminating concerns over falsifying personal history through curated digital possessions.

Of the 12 participants, nine would have preferred calling this grammar of action by a different name; cropping as a method of manipulating an image already exists (i.e. when unwanted outer areas of an image are removed), and this caused some confusion with those participants. Of those nine participants that wanted to rename this grammar of action, five could not think of a more appropriate name. Austin-23 said:

> *"This makes sense to me, but it can be confused with cropping an image. Cropping someone out makes sense, but if you're talking about cropping in two different ways to do with an image, that could be very confusing… I don't really know what else I could call it though!"*

Potential alternative names for this grammar of action were suggested: cropping out; removing; filtering; erasing. If this prototype were to be developed into a fully functioning grammar of action.

Condensing

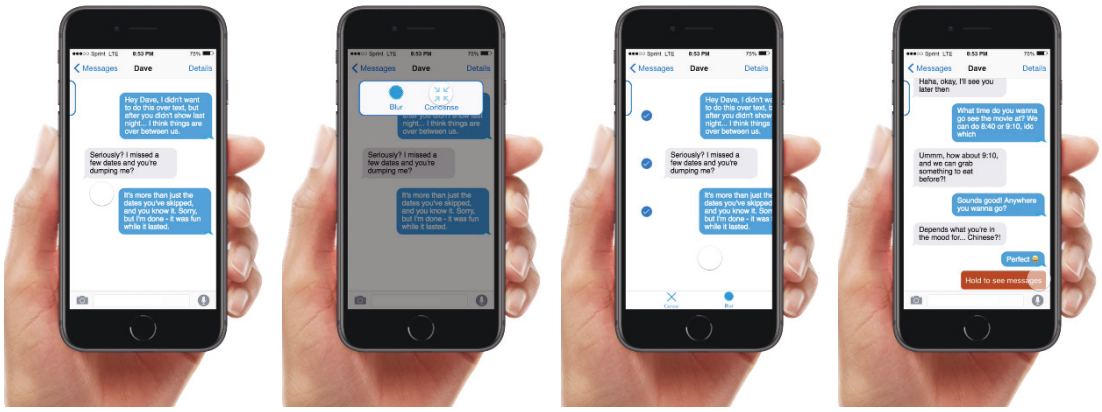

Figure 26: Stills taken from the Condensing prototype video.

To see the prototype video for the Condensing grammar of action, click here or follow the link in Table 8 above.

The majority of participants felt positively about Condensing; with seven of the participants seeing the value in this grammar of action, only three actively disliked it, and two others felt ambivalent towards it. As Condensing is quite similar to Blurring, both conceptually and in execution, participants were asked to draw comparisons between the two prototypes during the evaluation sessions.

The most common positive of Condensing over Blurring was that Condensing was a more unobtrusive method of curating digital possessions. Where blurred messages occupy the same amount of physical space on a screen as they did before they were blurred, participants commented that Condensing those messages reduces the amount of screen real-estate dedicated to digital possessions an individual actively does not want to see:

> *"Condensing isn't as in-your-face as Blurring, which is 'it's there but it's not there'. Condensing is more 'it's not there until I choose that it is'. It's less obtrusive."*

Condensing negatively associated digital possessions led to a lower number of visual cues in comparison to blurred messages, and participants specifically appreciated that Condensing provided individuals with less information than Blurring. For example, Condensed messages do not show an individual how long or

short they are, making the content harder to identify without expanding them. Victoria-27 said:

> *"We can't see how big or small the condensed messages are, or who said what, or how many were condensed at once. It provides less information compared to Blurring, which is why I'm a fan of this one."*

Sandra-56, Hannah-25, Emma-28, and Mary-50 saw value in Condensing as a tool for organising digital possessions into groups, likening this grammar of action to a traditional file structure on a computer. Hannah-25 said:

> *"It's kind of like sticking things into folders, organising messages into specific blocks that belong with one another."*

Sandra-56 suggested a change to Condensing that further parallels the actions available to users managing files on a computer:

> *"You could put a name to the condensed messages, to help you remember what the condensed bit is. If it's about financials, or something, you could condense it and call it 'Financial 1'. Like you're filing away different conversations."*

Sandra-56's suggestion may draw attention to these condensed digital possessions reducing the opportunity to disconnect from an ex-partner in return for efficiency in managing the digital possessions by attaching more information to condensed digital possessions makes them more easily identifiable. As Sandra-56 views Condensing as a way to organise digital possessions, it is not surprising that she might prefer to sacrifice abstraction and the disconnect that comes with it in order to have more control over the organisation of her digital possessions.

This prototype was designed as a way for individuals to hide digital possessions that they don't want to see or interact with. These participants found value not in the ability to disconnect from an ex-partner through Condensing, but in the opportunity to better sort and organise their digital possessions.

A notable critique of Condensing was made by Jacob-28. Previously in this thesis, I have highlighted how an individual abandoning their digital possessions is an issue. These individuals did not have access to the kinds of grammars of action that they wanted, so they simply did nothing to or with their digital possessions. Jacob-28 did

not see any value in Condensing, instead suggesting that abandoning his digital possessions was a way of curating them:

> *"I think, if you're done with each other, there's really no reason to go through the chat history, so you won't see the messages. And if you're still talking to each other, the new messages will eventually push the old stuff out of the way."*

Whereas participants in previous chapters resorted to abandoning digital possessions as a result of having no effective or appropriate grammars of action to engage in, Jacob-28 chose to abandon his digital possessions on purpose. A combination of time and the accumulation of new digital possessions would eventually make accidentally accessing the digital possessions from his past relationship unlikely through this low effort form of curation.

Replacing

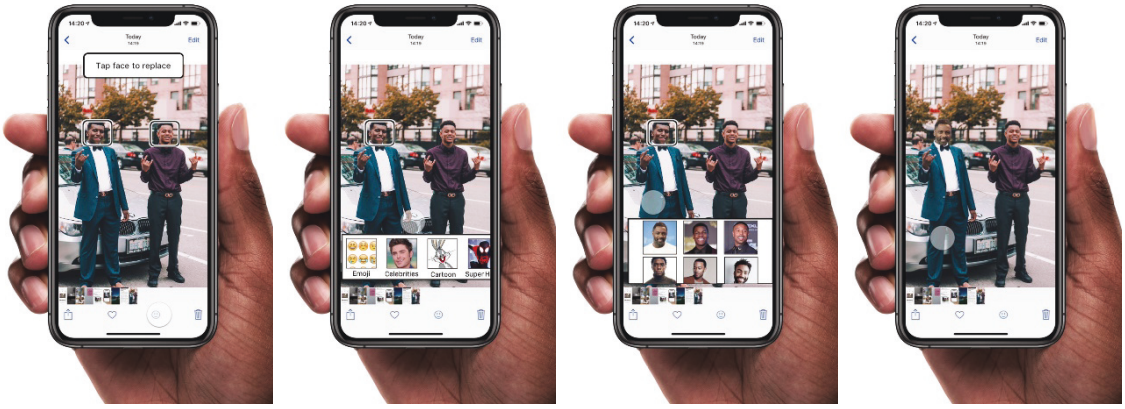

Figure 27: Stills taken from the Replacing prototype video.

To see the prototype video for the Replacing grammar of action, click here or follow the link in Table 8 above.

The initial concept for Replacing was intended to be fun by the design workshop participants; a way to engage with digital possessions from a past relationship and laugh as part of moving on. The participants in the evaluation sessions responded to this element of fun during the evaluation sessions; both the participants that viewed this prototype positively and those that viewed it negatively felt that it would be a light-hearted way to interact with their digital possessions. The differentiating factor between these two groups lay in whether they saw value in this grammar of action.

For the participants that viewed Replacing positively, there were two overarching reasons why; seeing value in it as a short-term interaction, and seeing value in it as a way to commiserate about a break up socially. Mary-50 believed that Replacing would be an effective way of raising her spirits after a break up, but thought that other prototype grammars of action would be more useful for long-term curation:

> *"This has novelty value, it would make me laugh, and cheer me up in the short-term. You know, 'Hey, I've been dating Idris Elba!' Long-term, I would just Crop him straight out of the picture. But this is fun!"*

The opinion that Replacing held no long-term value as a grammar of action was shared by participants that viewed Replacing negatively. Sandra-56 commented:

> *"It might bring temporary relief, to laugh at an image where you've replaced someone, but in the end you need to respect that you used to think this person was wonderful."*

The difference between Mary-50 and Sandra-56 is that Mary-50 sees value in a having a short-term solution when curating digital possessions from a break up, whereas Sandra-56 feels that the short-term relief Replacing offers is outweighed by the seriousness of the past relationship and how much the ex-partner previously meant to an individual. There is a fundamental difference in each participants' perspective towards how valuable an impact curation can have in the short-term.

Austin-23, William-23, Hannah-25, and Jessica-23 all talked about the social aspect of Replacing; to them, part of the fun of this grammar of action was in being able to share photographs with their friends or family where they replaced their ex-partner. Jessica-23 said:

> *"I would use Replacing for a laugh, to replace my ex and then send the picture to my friends to have some fun. I think it could help me to move on, making fun of my ex."*

Potential further iterations of this grammar of action could include an easy way to share digital possessions that have been Replaced, or even allow for co-Replacing, where multiple people can Replace content in a single image on their own devices.

Among all participants, it was clear that Replacing's value lies mostly in short-term application, as a way to make light of a break up, rather than as a serious method of managing and curating digital possessions post break up.

Adding a Custom Tag

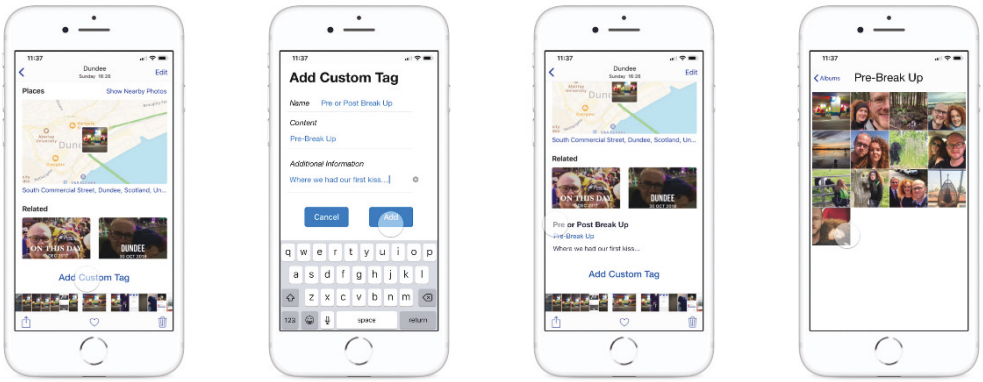

Figure 28: Stills taken from the Adding a Custom Tag prototype video.

To see the prototype video for the Blurring grammar of action, click here or follow the link in Table 8 above.

The majority of participants' attitudes towards Adding a Custom Tag were positive. Six participants responded positively to the grammar of action, four responded negatively, and two were ambivalent towards it.

Hannah-25, Emma-28, and Charlie-21 shared the most common positive piece of feedback from the evaluation of Adding a Custom Tag: that it allowed for organisation of digital possessions. This particularly appealed to Hannah-25, who thought that by categorising and sorting digital possessions into groups through custom tags, she would be able to use those groups to carry out other grammars of action on a mass scale:

> *"If you tagged a bunch of pictures as being pre-break up, and you didn't want to have to see them, you could hide all of the things with that tag. Fundamentally, this whole interaction is about organising, so you could use it as the basis for other interactions."*

Other participants also highlighted potential subsequent actions that could be carried out after adding custom tags to digital possessions: mass deletion (William-23), hiding photo thumbnails of previews of digital possessions (Jessica-23), and hiding photos in general (Ella-22 and Sam-20). Emma-28 saw value in the filtering aspect of Adding a Custom Tag. She highlighted two popular photo album apps as being limited in their ability to sort and filter photos that can be viewed, and saw

Adding a Custom Tag as a way to pre-empt awkward interactions with a current partner when confronted with digital possessions relating to an ex-partner:

> *"I think this would be really handy. I use Google Photos and iCloud Photos, and they're both like 'here's ALL your photos in an entire stream'. Me and my fiancé were scrolling through photos of us from 10 years ago, and it's just endless photos of his ex, my ex… it got incredibly awkward. "*

While Hannah-25 and Emma-28 saw Adding a Custom Tag as a way to categorise groups of digital possessions that they wanted to hide, Austin-23 felt that there was an opportunity to use this grammar of action to highlight digital possessions from a collection that were especially meaningful to him:

> *"It would be a good way of letting you say which photos you think are special. You might have decided to keep every photo from the relationship, but then you can give some a tag to show that they were more meaningful than others."*

Hannah-25, Emma-28, and Austin-23 each talked about the ways in which Adding a Custom Tag would impact their experience in managing and curating digital possessions after a break up. Sandra-56, however, commented on the key strength of Adding a Custom Tag as a grammar of action; the control it offers:

> *"With this, you've got a good sense of control over what happened, and by controlling those photos, you're controlling the idea of how you feel about those memories."*

All four participants that viewed Adding a Custom Tag negatively had the same issue with this grammar of action: that in order to add a custom tag to a digital possession, an individual would have to see or interact with a digital possession. Previous research shows us that curating in the context of a break up is emotionally taxing, and that it is an experience people often retreat from for this reason (Sas & Whittaker, 2013). Although these participants saw value in being able to attach meaningful data to their digital possessions, the prospect of revisiting as part of this experience did not appeal to them. William-23 most vehemently summed this up, saying:

> *"This is the exact opposite of what I would want. The fact that you have all these photos from the relationship to deal with is already a bit shit. But*

then you're going through photos and trying to collate all of these painful things in one place?! The only way I would find this useful is if you could select all photos with him and delete [laughs]."

Although William-23 was making a joke about deleting all the digital possessions relating to an ex-partner at once, he suggests using Adding a Custom Tag in the same manner that Hannah-25 and Emma-28 would use it to curate their collections. This would suggest that if the part of the process where photos had to be selected to add a tag could be automated, this grammar of action could still provide additional control over digital possessions to participants, without confronting them with memory cues of their past.

Hiding Information

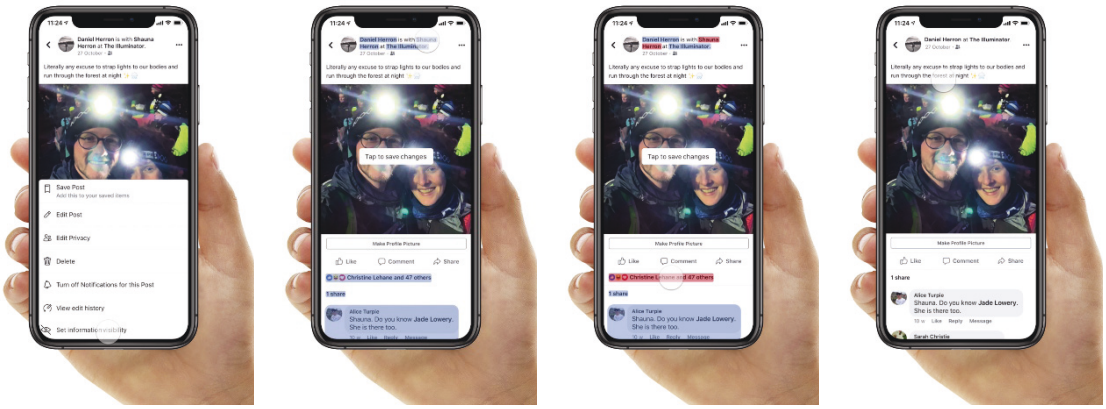

Figure 29: Stills taken from the Hiding Information prototype video.

To see the prototype video for the Hiding Information grammar of action, click here or follow the link in Table 8 above.

Hiding Information was the only prototype grammar of action that was viewed positively by every participant, and was seen by four participants as a way to manage wellbeing after a break up. Victoria-27 sums this up when discussing the benefits to hiding things that could be distressing or triggering for an individual, citing Hiding Information as a way for an individual to '*give themselves emotional support by using it, preventing them from seeing what makes them sad*'.

Some participants (n=5) highlighted the user-facing nature of Hiding Information as a positive attribute of this grammar of action. Austin-23 commented:

"I guess Hiding Information is more something for me than for anyone else… If I want to keep a photo up, then doing this is for my own good - to be like 'It's a good memory, but I don't want to see this and this and that!'"

Related to previous participants' experiences that curating and managing digital possessions post-break can articulate a narrative of the break up (as discussed in Chapter 6), Charlie-21 appreciated that Hiding Information would make changes only visible to the user:

"It's always awkward when you untag someone from a photo, because they inevitably find out. With this I can hide what I want and not have to worry about other people reacting – it's all at my own discretion."

Emma-28 and Ella-22 identified Hiding Information as a positive intermediate grammar of action that currently does not exist in the digital possession management eco-system on social networking sites, that could allow an individual to hide parts of a digital possession that are distressing. Sam-20 commented:

"This is great, because it lets your posts live on, but you don't have to see the things you don't want to, like your ex's name. It gives you an intermediate step between hiding this completely and letting me still see it."

The majority of participants (n=8) disliked the name of this grammar of action. Half of those participants felt that Hiding Information was not an accurate enough descriptor, but the other half (Sandra-56, Emma-28, Mary-50, and Victoria-27) took issue with the word 'hiding'. These four participants all felt that 'hiding' had negative connotations, and that the term would prompt individuals who were engaging in Hiding Information to view their actions as sneaky or guilty. Mary-50 summed it up, saying:

"I don't like the word hide. Hiding implies a secret, a bit of guilt, or something sneaky. I prefer not to use those negative kinds of words, they have the wrong vibe."

Sandra-56 felt that Hiding Information implied that the person doing the hiding '*was a victim, running away or hiding from their break up'*. In lieu of Hiding, participants suggested more practical, factual language that would empower users, such as 'Toggle Visibility' or 'Setting Visibility'. Victoria-27 said:

"If the name is 'hiding something', it implies you feel guilty, and have to hide what you're doing. But if it's something like 'Setting Visibility', it's like, I have control! I can set what can be seen. It feels more powerful!"

Setting a Time Range

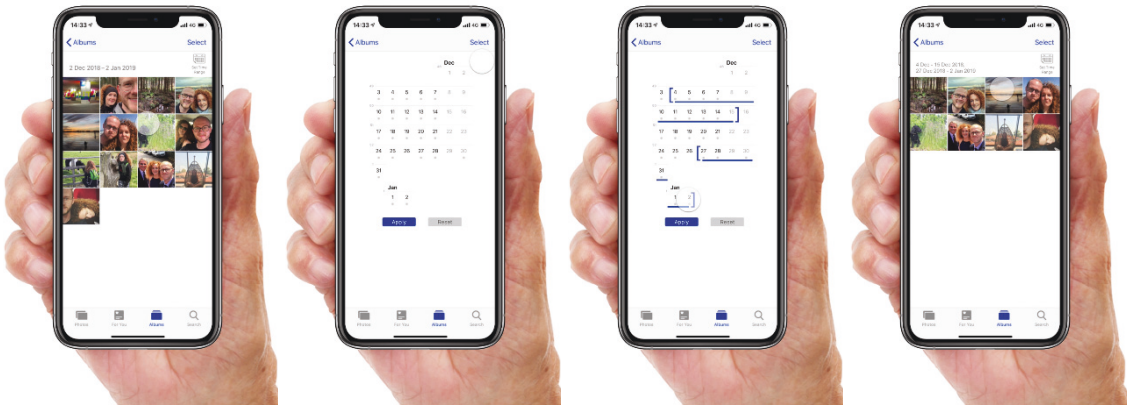

Figure 30: Stills taken from the Setting a Time Range prototype video.

To see the prototype video for the Setting a Time Range grammar of action, click here or follow the link in Table 8 above.

Although the majority of participants (n=10) felt positively towards Setting a Time Range as a grammar of action, they were not particularly enthusiastic about the prototype. The idea that large groups of digital possessions could be filtered and managed was appealing to the participants, but five of them felt that Setting a Time Range, as a grammar of action aimed at organising digital possessions, was too limited in its functionality. This concern was founded on two beliefs: William-23, Hannah-25, and Jessica-23 felt that it would be too difficult for most individuals to remember specific dates that digital possessions were created on in order to decide what they might want to include or exclude in their collection. Jessica-23 said:

"I think it could be hard to use, especially for people that don't remember timelines or people with bad memories. If you couldn't remember specific dates, you wouldn't be able to block things out."

Despite thinking that date ranges would be a difficult way to make selections, none of these three participants suggested an alternative that they thought would be better. The second belief that contributed to participants' concerns was that dates may not be a granular enough measure of time to support an individual in including digital possessions they want to see and excluding digital possessions they don't

want to see in their collections. Jacob-28 highlighted the fact that a digital possession with a negative connotation will not always be the only digital possession concerning an ex-partner on a single date:

> *"Reality is going to more mixed up than what you can filter here. On one day you might be fine in the morning, then shouting at each other in the evening, but only want to hide something from that evening"*

Sam-20 took this a step further, commenting that there may be photographs that have nothing to do with a relationship taken on the same day as a photograph that a user might want to exclude from their collection:

> *"There might be a photo that gets hidden that has nothing to do with the relationship, or to do with the argument. I might take a picture of something else on that same day that I need, like my timetable, and it would get hidden too. I think the Custom Tag system is a better way of doing this."*

Although Setting a Time Range might work well for individuals that do not mind having digital possessions that have nothing to do with their ex-partner swept up in the curation of more relevant digital possessions, it may be too broad a grammar of action to be useful.

Three participants suggested the same potential improvement to Setting a Time Range: rather than setting multiple ranges for digital possessions that you want to be included in your collection, Austin-23, Mary-50, and Charlie-21 felt that it would be more practical to set ranges for the digital possessions that you want to hide. Austin-23 said:

> *"I would set a time range for things that I don't want to see, rather than select everything I do want to see. You're likely to have more good things than bad, so you might just want to get rid of one week, rather than going through every single week that you want to keep in."*

Mary-50 added that reversing the focus from selecting digital possessions to include to selecting digital possessions to exclude would be more intuitive in the context of a break up, commenting:

"It's more to the heart of it, because it's not 'I like them and them and them', it's 'I don't like them'. That's what my mind would be focusing on when if I was managing photos like this."

Importing an Ex's Digital Possessions

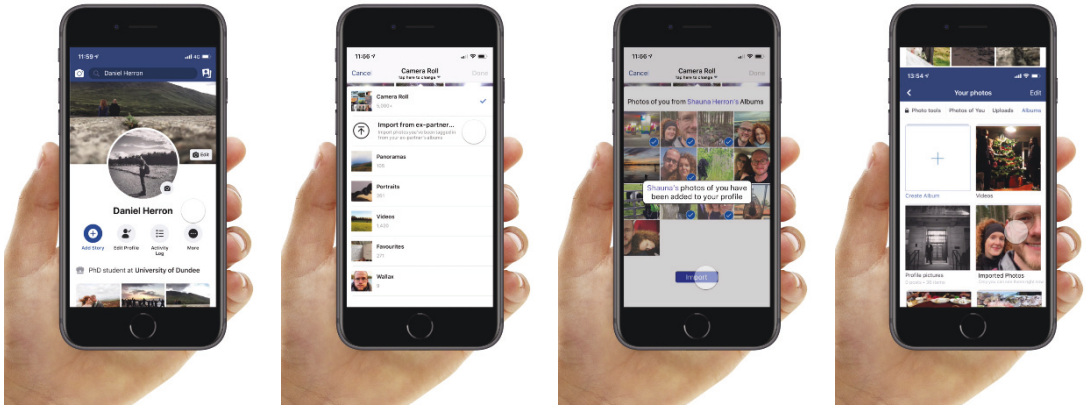

Figure 31: Stills taken from the Importing an Ex's Digital Possessions prototype video.

To see the prototype video for the Importing an Ex's Digital Possessions grammar of action, click here or follow the link in Table 8 above.

Jacob-28, Hannah-25, Emma-28, and Mary-50 all had experience of an ex-partner limiting or removing their access to digital possessions after their break ups. As a result, these four felt strongly positive about Importing an Ex's Digital Possessions. Whereas other participants raised questions around ownership and access rights, these participants immediately saw value in being able to regain control of digital possessions they had once considered to be shared between themselves and their ex-partner.

Jacob-28 and Emma-28 recalled their efforts at regaining access to photographs from their ex-partners post-break up. Jacob-28 physically stole a camera from his ex-girlfriend in order to access the digital possessions on the SD card, and discussed downloading the images from her Facebook profile as an alternative method of collecting these photographs. Emma-28 shared her experience of downloading photos from her ex-boyfriend's Facebook profile, despite the fact that he had blocked her after their break up:

"My ex was the one that took all the photos, and when we broke up, I didn't have any. He blocked me on Facebook, so I couldn't even get copies. But I told a friend not to block him after our break up, and we sat together going through his profile, deciding what images to download! We had to do it one-by-one, which took a long time, but that's how it works on Facebook if the photos aren't on your profile!"

Regaining access to digital possessions after a break up was deemed so important that Emma-28 resorted to trickery and a laborious and repetitive process to gather the meaningful photos from her relationship. Importing an Ex's Digital Possessions was clearly deemed useful by participants for whom it would have resolved issues in past experiences.

Four participants (Sandra-56, Victoria-27, Ella-22, and Sam-20) felt negatively towards Importing an Ex's Digital Possessions as a grammar of action. Despite being told that this grammar of action would only work if an ex-partners' profile was accessible to a user, Sandra-56 and Ella-22 discussed the importance of respecting an ex-partner's privacy, and accepting that an individual will not always be able to access their ex-partners' digital possessions:

"My initial reaction is that it might be better to make people aware from the start that when people take photographs, those photographs belong to them... I think it would be better to say 'sorry, that person took these photographs, and they belong to them'… You just have to come to terms with that."

Sandra-56 raised an interesting point around ownership and how the end of a formalised relationship deals with dividing physical property between ex-partners. She said:

"I'm pretty well-versed in the concept of marital property, because of my separation, and there's this idea of the marital estate; that what you bring to the marriage is yours afterwards, but what you have during the marriage is shared. On separation you divide things up, and you reach a point where you say: 'that isn't mine anymore.'"

While reaching this point is true of physical possessions, digital possessions often don't need to be divided up – the nature of many digital possessions is that they can be copied and shared without ex-partners losing access to them. This idea of

dividing up property between ex-partners at the end of a relationship could form the basis for a new grammar of action to support curation of shared possessions post-break up.

7.5 Discussion

The results of this research, in combination with the research reported on in Chapter 6, fill the gap identified in Chapter 2 of this thesis, and answer the third and final research question as proposed in Chapter 1: How can interaction design support the management of digital possessions after a relationship break up? I have shown that by developing prototypes according to design dimensions based on the real experiences of individuals who have gone through a relationship break up (and faced issues of curation and management in a digital context), it is possible to create grammars of action that other individuals who have also experienced this life transition believe would support them in more useful management and curation of their digital possessions post-break up.

Human relationships are very individual; we have a plethora of ways to connect with partners in a digital context, and to represent relationships through digital possessions. The unique combination of relationship, break up, personality, digital possession, platform, and curation or management aim means that no single grammar of action will be useful for every person in the context of a relationship break up. The results of my evaluation sessions show this. Importing an Ex's Digital Possessions is a prime example of a grammar of action that splits opinion strongly based on past experience. For participants that had lost access to digital possessions after their breaks ups, this grammar of action represented a solution to a difficult and painful problem. For participants who had not experienced this, or for participants who had concerns over privacy in a digital context, Importing an Ex's Digital Possessions was viewed negatively, and raised questions around ownership and rights.

Even a grammar of action like Hiding Information, which was viewed positively by all of the evaluation session participants, may not be viewed positively by every person who has experienced a break up. Similarly, Cropping was viewed negatively by the majority of the participants, yet all 12 said that they saw value in it as a grammar of action. For quick reference as to the prevailing attitude of participants towards each

prototype grammar of action, I list majority positive or negative sentiment in Table 10 below.

Blurring and Cropping were the only two prototypes that were mostly viewed negatively by participants. These two grammars of action were aimed at obscuring or removing content relating to or depicting an ex-partner from a digital possession. In both cases, the participants had concerns that the grammars of action would draw attention to the sensitive content or the connection to an ex-partner by virtue of being used to manage and curate those digital possessions.

Prototype	Sentiment
Blurring	**Negative** (3 Positive, 9 Negative)
Cropping	**Negative** (5 Positive, 7 Negative)
Condensing	**Positive** (7 Positive, 3 Negative, 2 Ambivalent)
Replacing	**Positive** (5 Positive, 4 Negative, 3 Ambivalent)
Adding a Custom Tag	**Positive** (6 Positive, 4 Negative, 2 Ambivalent)
Hiding Information	**Positive** (12 Positive)
Setting a Time Range	**Positive** (10 Positive, 3 Negative)
Importing Ex's Digital Possessions	**Positive** (7 Positive, 5 Negative)

Table 10: Summary of participant sentiment towards each prototype grammar of action.

In contrast, one key highlight of Hiding Information (the most positively viewed grammar of action) was that it gave a high amount of control to the individual, and it did not draw attention to its effect, as a user-facing change, rather than a public-facing one. The participants directly compared Blurring and Condensing to one another, emphasising that Condensing was preferable as a more unobtrusive method of curating. It may be that the more a grammar of action increases the users' level of control over their digital possessions, and the more subtle the effect of using that grammar of action, the more positive participants felt towards it.

Human experiences are incredibly nuanced, and there are no one-size-fits-all solutions to managing and curating digital possessions in the context of a relationship break up. Rather than trying to design a single perfect grammar of action to support people in this context (or even a set of eight perfect grammars of action), the focus of future work in this space should be on creating more grammars of action that cater to a variety of other digital curation and management break up limitations and experiences.

Even within the research documented in this chapter, there are more opportunities to create grammars of action within my design dimensions. The participants in the design workshops focused primarily on Context in their solutions; as mentioned previously, the concepts they produced around Temporality and Stewardship operated on a collection and individual digital possession level. The participants did not consider how Temporality and Stewardship could be used to curate and manage digital possessions on a content level.

Based on research documented in previous chapters, there is an opportunity for Temporality-focused grammars of action to revert content in digital possessions to different points in time (i.e. before meeting a partner, or before sharing access to that digital possession with a partner). This kind of grammar of action could specifically apply to Sophie-25's experience of sharing a single Netflix profile in Chapter 5, or Wilson-23's experience with irremovable digital traces of his ex-girlfriend on his eBay account in Chapter 6.

Similarly, there are opportunities within Stewardship on a content level that the design workshop participants did not explore. Sandra-56's discussion of the marital estate in the context of physical possessions during her evaluation session could prompt the creation of a grammar of action to facilitate sharing of possessions between partners upon a relationship ending. When a relationship status on a social networking site changes from 'in a relationship' to 'single', copies of the digital possessions created by partners during the relationship could be automatically shared with each individual, so that everyone has access to previously shared possessions. Curation on these shared possessions could be carried out by ex-partners independently of one-another and eliminate awkward or difficult social issues caused by blocking or revoking access immediately after break up.

7.6 Conclusion

In this chapter I reported on two design workshops, prototype development, and evaluation sessions concerning the creation of new grammars of action. This research, in combination with the research documented in Chapter 6, answers the third and final research question posed in Chapter 1 of this thesis: How can interaction design support the management of digital possessions after a relationship break up? The design workshops produced eight interaction concepts

that were guided by three design dimensions, as established in Chapter 6: Temporality, Stewardship, and Context.

These interaction concepts were used to develop paper prototype grammars of action, which were in turn used to develop high-fidelity prototype grammars of action. These prototypes were subsequently evaluated with participants who had experienced the end of a romantic relationship. The evaluation sessions revealed varying degrees of value in the prototype grammars of action, with participants reacting positively or negatively depending on a number of factors, including their personal experiences and their attitude towards curation in a post-break up digital context.

The results of the evaluation sessions show that interaction design can indeed be used to support the management of digital possessions post-break up. This method of establishing design dimensions based on contextually relevant real-world experiences, and then using those dimensions to guide design, is a successful way by which researchers and designers can scope new interactions in a given context. I recognise that there are further opportunities for design using these design dimensions within the context of a relationship break up, which could be addressed in future work.

CHAPTER 8.
CONCLUSIONS

CHAPTER SUMMARY

Through a series of studies, I have developed a set of prototype grammars of action that can be used to support individuals in curating and managing their digital possessions in the context of a relationship break up. The creation of these new methods of interaction come as the result of research that: (a) developed an understanding of peoples' attitudes towards their digital possessions from a past relationship, and whether those attitudes changed as a result of a break up; (b) explored the ways in which people dealt with their digital possessions after a break up; and (c) developed a set of design dimensions to guide the creation of these prototype grammars of action through design workshops and prototyping, from early concepts to high fidelity prototypes.

I now move forward to outline and explain our contributions to knowledge, acknowledge the limitations of this research, and discuss directions for future work based on this PhD.

8.1 Introduction

In this chapter, I will summarise the research presented in this thesis, outline the contributions to knowledge this research has made, discuss the limitations of this research, and identify opportunities for future work based on this PhD.

8.2 Summary of Research

Relationships enacted in a digital context will typically see partners accrue a substantial number of digital possessions. Individuals in romantic relationships now engage in and maintain their relationships in a digital context as much as in the real world. Online dating services have become a widely accepted and mainstream method of finding a partner, so much so that it is not unusual for relationships to begin over a digital medium. By generating digital content both offline (e.g. taking photos or making videos on a smartphone) and online (e.g. writing posts on social networking sites (SNS) or sending messages through communication technologies such as Facebook Messenger or WhatsApp), individuals weave together their digital presences, creating digital identities for themselves as individuals 'in a relationship'.

While in a relationship, this entangling of digital presences serves a positive purpose in connecting partners together. However, when a relationship comes to an end, all of the digital possessions acting as connections can become a burden. These digital possessions, which previously contributed to an individual's identity as a partner in a relationship, do not just disappear. Instead, the persistence of digital possessions often requires that an individual manage and curate each possession as part of disconnecting from their ex-partner and moving on. The tools that are available for individuals seeking to manage and curate their digital possessions in the context of a relationship break up are limited in their functionality, and individuals faced with this problem are often forced to leave the task incomplete.

To address this, this thesis presented a set of prototype grammars of action aimed at supporting individuals in curating and managing their digital possessions post-break up. In order to ensure that any new grammars of action developed as the result of this work would be effective at curation in the context of a relationship break up, research was conducted to explore the experience of a modern-day relationship break up, and to develop an understanding of the ways in which an individuals' attitudes towards their digital possessions changed or stayed the same

after a break up (as documented in Chapter 4). In this initial study, I found that there is not always a change in attitude towards digital possessions from pre-break up to post-break up, but across all eight participants, when an attitude towards a digital possession did change, it was from positive to negative as a result of the break up experience. This answers the first research question posed in Chapter 1 of this thesis: How does an individual's perspective on their digital possessions change after a relationship break up?

I discovered that digital possessions could become tainted as a result of a break up, caught in an in-between state where the presence of an ex-partner negatively shadowed an otherwise positive digital possession. Participants felt that these tainted digital possessions could not be deleted, because they held too much meaning, but they also did not want to interact with them, due to their connection to their ex-partner. I also found that the persistence inherent in a digital medium (i.e. that a digital possession would not change until some action was taken) meant that ex-partners continued to be connected after their break ups by their digital possessions. I hypothesised that by managing these digital possessions, and individual could manage that connection, effectively disengaging and decoupling themselves from their ex-partner in a digital context.

Subsequently, research was carried out to explore the ways in which individuals interact with and manage their digital possessions after a break up. The aim of this work was to determine how technology could support ex-partners in managing digital possessions as part of managing their connections with one another (as documented in Chapter 5). This second study revealed that digital possessions can play a variety of roles after a break up, from acting as proof of a relationship being bad (and social validation for a break up), to evidence with law enforcement to have the police address issues of harassment. Through this research I also found that participants were not always able to manage their digital possessions post-break up in the ways that they wanted to, answering the second research question posed in Chapter 1 of this thesis: How are digital possessions relating to a relationship managed (or not) after a relationship break up? Participants shared stories of times that they were forced to abandon digital possessions because there was no suitable method of curation available to allow them to manage their digital possessions in the ways that they wanted to. This finding highlighted an opportunity to further explore the ways in which technology limits individuals in curating their digital

possessions post-break up in the ways that they want to, or in ways which are meaningful to them.

The third research study carried out as part of this PhD aimed to further understand the ways in which individuals were limited in managing their digital possessions in the ways that they wanted to, after a break up (as documented in Chapter 6). The participants shared: experiences around their ex-partners being in control of previously shared digital possessions post-break up; stories of times when current curation and management methods failed to help them deal with digital traces of ex-partners; concerns about the effect curation of public digital possessions had on the narratives of their break ups; and feelings of guilt and regret post-break up at having made certain digital possessions during the relationship. The issues and needs that participants highlighted from their personal experiences were used to produce three design dimensions: Temporality, Stewardship, and Context. The creation of these design dimensions was the first step towards building new grammars of action that could better support individuals in curation and management of digital possessions in the context of a relationship break up, as part of answering the third research question posed in Chapter 1 of this thesis: How can interaction design support the management of digital possessions after a relationship break up?

The fourth and final piece of work comprising this research used these design dimensions to guide the creation of new grammars of action. Two design workshops were run to generate concept interactions within the three design dimensions. Eight concepts were produced across the two workshops, which were used to develop paper prototype grammars of action, which in turn were used to develop high-fidelity prototype grammars of action. These prototypes were subsequently evaluated with participants who had experienced a relationship break up and had digital possessions connected to that past relationship.

Through these evaluation sessions I found that the prototype grammars of action were seen to be relevant and useful to different participants, depending on the participants' personal experience of a relationship break up, and their attitude towards curation and management of digital possessions in a post-break up context. These prototype grammars of action complete the answer to the third research question mentioned above, as proof that interaction design can support individuals in the management and curation of digital possessions after a relationship break up.

The method by which I generated these prototype grammars of action can be repeated to create more grammars of action in the context of a relationship break up. Or, with the creation of new design dimensions based on more research, this method could be used to generate prototype grammars of action to curate and manage digital possessions in a different context.

8.3 CONTRIBUTIONS

I identified four contributions to knowledge as a result of this PhD research:

1. The introduction and evaluation of eight prototype grammars of action, which can be used to better support individuals in managing and curating their digital possessions in the context of a relationship break up;
2. Documentation of a reproducible method for identifying contextually relevant design dimensions to guide the development of grammars of action for the curation and management of digital possessions across different life transitions (including romantic relationship break up);
3. Findings from 8 semi-structured interviews with individuals who had experienced a romantic relationship break up. These findings demonstrate an understanding of the ways in which an individuals' attitude towards digital possessions change after a relationship break up, including the identification of 'tainted' digital possessions;
4. Findings from 10 semi-structured interviews with individuals who had experienced a romantic relationship break up. These findings demonstrate an understanding of the current technological limitations that individuals are confronted with when attempting to curate and manage their digital possessions after a relationship break up.

8.4 REFLECTIONS

In this section I will outline and reflect on the limitations of this research, as well as the process of managing group conflict during data analysis.

8.4.1 LIMITATIONS

There are several limitations to this research.

The first, largest, and most consistent limitation of this research was that recruitment of participants in this sensitive context was difficult. Participants were asked to

share intimate details of their lives in research sessions, answering questions posed by someone they didn't know, and often inviting this unknown researcher into their home as part of the experience. This is, without a doubt, a lot to ask of a research participant, and so it is not surprising that recruitment for these studies was a difficult process.

While the number of participants in each study allowed for reliable results from the analyses, the difficulty I had in recruiting meant that my inclusion criteria became quite broad. I recruited participants under a general umbrella of 'people who have been in a romantic relationship that ended in a break up, separation, or divorce'; although this allowed me to recruit the number of participants I needed, it did not allow for nuance in those participant groups. For example: rather than, in a single study, focusing on the experiences of individuals who had been married for 5 years before initiating a breaking up, within one study I instead spoke to participants with (sometimes large) variations in relationship length and the role they played in the dissolution of their relationship. I was not able to recruit a sample in any study with a uniform set of relationship and break up characteristics (such as length of the relationship, dumper versus dumpee, time since break up, or sexual orientation of the participant); this mix of participant perspectives within the broad recruitment criteria I operated with will have affected the results of this research.

As homogeneity in my samples was not possible, I pivoted my recruitment strategy across the PhD to focus on being as inclusive as possible, recruiting participants who had experienced a break up, regardless of their relationship and break up experiences. This allowed me to achieve sample sizes that were typical of qualitative research in sensitive contexts, where I could focus on developing a deep understanding of the unique experiences the participants shared with us. Instead of finding value in large quantities of participant data, or in the experiences of individuals who matched granular and homogenous recruitment criteria, the value of this research came from the depth of the exploration and the quality of the stories that participants shared with me.

A second limitation of this research was in the type of data collected; by adopting an Experience-Centred Design (ECD) approach, participant data was gathered in story form. ECD allowed for the creation of a more casual interview experience for participants, and sped up the process of creating a rapport, but may have resulted

in a more familiar account of participant experiences than if a more structured approach to the interview sessions was adopted.

If, rather than asking participants to recount a story specific to a digital possession, they had been tasked with specifically discussing their actions or their practices around the curation of digital possessions, the results of those studies could have differed. This is not to say that a different style of interviews could have been more effective, but it is worth calling out that adopting a different approach to those sessions could have resulted in a different set of results; and that the results reported in this thesis are not the only possible results that could have come from those interviews.

A third limitation of this research was that it was run entirely in the UK, with participants who were primarily from western and English-speaking cultures. The interviews, design workshops, and evaluation sessions were conducted exclusively in English, regardless of the first language of the participants. Therefore, it is important to recognise that the experiences that shaped these findings and ultimately informed the prototype grammars of action were biased towards UK and western culture; these findings and grammars of action may not generalise everywhere.

Not only are relationships and gender roles within those relationships different depending on the culture of the individuals, but rituals around relationship break in non-Western, English speaking countries may also differ from the experiences this research primarily focused on. Incorporating the experiences of individuals from other countries and cultures could have resulted in a very different understanding of this research space.

8.4.2 Managing Conflict in Affinity Diagramming

My approach to data analysis transitioned from Thematic Analysis to Affinity Diagramming in my second study - an analysis method that I employed again in the third study of this PhD. As mentioned in Chapter 6, the rationale for this change was my desire to leverage the skills and insights of multiple researchers when analysing interview data. I wanted to reflect on the preparation and execution of each of these Affinity Diagramming experiences; the process I employed in the first instance of Affinity Diagramming resulted in a tense conflict between researchers. Revising my

approach in the second instance allowed me to lead a much more collegiate analysis experience.

Affinity notes in the first instance of this analysis were divided into two sets: one for the group of four researchers to organise, and one for me to organise afterwards based on the structure they laid out. I gave each researcher a quarter of their data set to begin organising, asking them to group their notes by their affinity to one another. After the researchers had completed their initial structures, I asked them to work as a team to combine their diagrams and iterate on the groups of notes as they went.

It was at this point that conflict began to arise; two of the four researchers staunchly disagreed on how they should combine their groups, each one sure that their structure and group names was correct. What started out as a discussion quickly became an argument, and to diffuse the situation we broke for lunch and spent an hour apart. After coming back together, the two researchers sure that each of their affinity diagrams was superior to the others, and it took a lot of work from myself and the other two researchers to encourage compromise and arrive at an agreed structure.

On reflection, I realised that the conflict arose from the individual nature of the tasks I assigned the researchers; although their overall aim was to create an Affinity Diagram as a team, their first task saw them working alone. I believe the two researchers who argued did so because they became attached to the work they had done individually, and I had not sufficiently sign-posted subsequent activities that would involve teamwork and compromise to reach a final Affinity Diagram structure.

In the second instance of Affinity Diagramming as part of the third study in this thesis, I revised the tasks given to the team of researchers as they analysed the data. Those researchers were never given the opportunity to work individually; instead, I had them work as a team to build out the initial Affinity Diagramming structure. By removing the need to combine smaller structures, there was no similar opportunity for conflict at that stage of the analysis. Instead of combining structures, the researchers went straight into iterating their structure based on the groups they had created as a team.

8.5 Future Work

Understanding relationship break ups and the ways in which individuals can be supported in managing and curating their digital possessions post-break up is a complex problem. There are opportunities for further research in this area based on the findings of this PhD.

8.5.1 Designing for Other 'Endings'

Through this research, I have seen the potentially positive impact context-specific grammars of action can have. By understanding the curation and management limitations individuals faced when dealing with their digital possessions after a relationship break up, I was able to guide the design and implementation of high-fidelity prototypes that can better support these individuals in achieving their curation goals post-break up.

The process of understanding limitations and developing design dimensions (as documented in Chapter 6), prototyping grammars of action that overcome those limitations, and evaluating those prototypes (as documented in Chapter 7) can be used to guide the construction of new grammars of action in contexts other than relationship break up. Further research could be carried out using this approach with regards to other 'endings', such as at the end of a friendship or after the death of a loved one, resulting in a gamut of new grammars of action that cater to curation and management of digital possessions in a variety of contexts.

8.5.2 Adopting a Multi-Cultural Perspective

As was highlighted in the Limitations section above, the research documented in this thesis was run in the UK, with participants who were primarily from western and English-speaking cultures. It would be interesting to follow the same research process (of understanding limitations and developing design dimensions, prototyping grammars of action that overcome those limitations, and evaluating those prototypes) across a variety of diverse locales and nationalities separate from typical western culture, for example: South America; India; China, South-East Asia.

The research could not only result in the design of culturally relevant, context-specific grammars of action to support digital curation post-break up, but also allow for the development of a cross-cultural understanding of relationship break up in a digital context.

8.5.3 Evaluating Fully Functional Grammars of Action

The research documented in this thesis evaluated high-fidelity prototype grammars of action. Future work could involve the development and implementation of fully functional grammars of action across various platforms as identified in this thesis, for example: on popular smartphone operating systems such as iOS or Android; on social networking sites like Facebook, Instagram, or Twitter; on services such as Google Maps, Netflix or eBay.

Subsequently, research could be used to evaluate these fully functional grammars of action based on the experiences of individuals that use them to curate and manage their digital possessions post-break up.

8.5.4 Triangulation of Qualitative Evaluation

Finally, a potential direction for future research as a result of this work may be the triangulation of qualitative findings through quantitative research. The use of surveys or questionnaires to determine whether or not the findings from this qualitative investigation are generalisable to various groups (e.g. general UK population, or individuals from a combination of western cultures) could be an important step towards providing individuals with relevant and useful grammars of action for curation in a post-break up context at scale.

8.6 Closing Remarks

While in a romantic relationship, the entangling of digital presences serves a purpose in connecting partners together. However, when a relationship comes to an end, all of the digital possessions acting as connections between ex-partners can become a burden. Attempts to manage and curate digital possessions after a break up are often abandoned due to a lack of available nuanced and contextually relevant grammars of action.

In this thesis, I adopted an Experience-Centred Design approach to understand: participants' post-break up attitudes towards their digital possessions; the ways in which they manage (or do not manage) those possessions after a break up; and the ways in which participants are currently not being supported in their curation needs within the context of a relationship break up. I developed and evaluated a set of prototype grammars of action that I believe address this lack of support.

I believe that the method by which I created these grammars of action will be useful to the HCI and Interaction Design research communities, as a guide to creating contextually relevant grammars of action in other currently unsupported contexts.

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APPENDICIES

APPENDIX A.

ETHICAL APPROVAL FORMS

This appendix contains letters of approval from the University Research Ethics Committee for Studies 1 & 2, and from the School Ethics Research Committee for Study 3 and Study 4.

A.1 Ethical Approval for Studies Documented in Chapter 4 & Chapter 5

School of Psychology

University of Dundee Research Ethics Committee

University of Dundee
Dundee
DD1 4HN

13th March 2015

Dear Mr Herron,

Application Number: UREC 15013

Title: Digital Breakup, Separation and Divorce

I am writing to you to advise you that your ethics application has been reviewed and approved by the University of Dundee Research Ethics Committee.

Approval is valid for three years from the date of this letter. Should your study continue beyond this point, please request a renewal of the approval.

Any changes to the approved documentation (e.g., study protocol, information sheet, consent form), must be approved by UREC.

Yours sincerely,

Dr Astrid Schloerscheidt
Chair, University of Dundee Research Ethics Committee

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A.2 Ethical Approval for Study Documented in Chapter 6

Duncan of Jordanstone College of Art and Design

Dean
Professor Paul Harris FRSA

Daniel Herron
PhD Student
DJCAD
University of Dundee

4 May 2017

Dear Daniel

Application for Amendment to UREC 15013 Digital Break Up, Separation and Divorce. Confirmation of Approval

Thank you for your application for amendment to your ethics application as above which has now been reviewed. The review considered the following documents:

1. Amendment application
2. Participant Information Sheet
3. Consent Form
4. Audio Consent Form
5. Demographics Questionnaire

I am pleased to advise you that this amendment has now been approved.
Please note that you are responsible for monitoring the project on an on-going basis.
Your Supervisor is responsible for independently monitoring the project as appropriate.
The project may be audited during or after its lifetime by the University.

The School Research Ethics Committee should be notified of any adverse or unforeseen circumstances arising out of this study or of any emerging ethical concerns that you or your Supervisor may have about the research once it has commenced.

I wish you success with your project.

Kind regards

Jeanette Paul
Convenor SREC
Duncan of Jordanstone College of Art & Design

djcad duncan of jordanstone college of art & design

UNIVERSITY OF DUNDEE Dundee DD1 4HT Scotland UK *t* +44 (0) 1382 385251
email p.a.third@dundee.ac.uk | http://www.dundee.ac.uk/djcad

A.3 Ethical Approval for Study Documented in Chapter 7

Duncan of Jordanstone College of Art and Design

Dean
Professor Paul Harris FRSA

School of Art & Design Research Ethics Committee
Duncan of Jordanstone College of Art & Design (DJCAD)
University of Dundee
Dundee
DD1 4HN

Daniel Herron
PhD Student

16 November 2018

Dear Mr Herron

Application number: SDAD-18-RPG0119
Title: Evaluating Prototypes to Support Post-Break Up Management of Digital Possessions – Study 4

I am writing to advise you that your ethics application has been reviewed and approved on behalf of the School of Art & Design (DJCAD) Research Ethics Committee.

Approval is valid for three years from the date of this letter. Should your study continue beyond this point, please request a renewal of the approval.

Any changes to the approved documentation (e.g., study protocol, information sheet, consent form) must be approved by this SREC.

Kind regards

Jeanette Paul
Convenor SREC
Duncan of Jordanstone College of Art & Design

Cc Fiona Fyffe-Lawson
Prof. Wendy Moncur

UNIVERSITY OF DUNDEE Dundee DD1 4HT Scotland UK *t* +44 (0) 1382 385251
email p.a.third@dundee.ac.uk | http://www.dundee.ac.uk/djcad

APPENDIX B.

STUDY 1: RESEARCH MATERIALS

This appendix contains study materials used during the research as documented in Chapter 4 (Exploring the Experience of Digital Break Up).

B.1 INFORMATION SHEET

INFORMATION SHEET
Digital Breakup, Separation and Divorce

INVITATION TO TAKE PART IN A RESEARCH STUDY
We would like you to take part in a study (Digital Breakup, Separation and Divorce) led by Daniel Herron, a PhD student at the University of Dundee. Before deciding whether or not you would like to take part, we would like to explain to you why the study is taking place, and what it would involve for you. Please take time to read the following information and discuss it with the researcher if you wish. The researcher is happy to answer any questions or provide more information if asked.

PURPOSE OF THE RESEARCH STUDY
With the introduction (and growing popularity) of Social Networking Sites (SNS) such as Facebook, Twitter and Instagram over the last decade, the average Internet user has found that their virtual and physical lives have become more intertwined. Through SNS, many life events can become more public; notifications can alert friends to things such as a user's new job, an addition to their family, or to their birthday. These notifications can also highlight personal experiences, such as a user's change in relationship status, and not always in a positive way. The purpose of this Digital Separations project is to determine how people can be supported by technology during and after a breakup; the researcher also wants to examine how this type of life transition affects a person's online digital possessions.

What is involved in participating in the study?
If you choose to join this part of the project you will be asked to take part in an interview (one-on-one, or one-to-two) about how your past breakups have translated across to your digital space. The researcher will ask you for a bit of background about your relationship, information on how your digital possessions, or artefacts, were affected by your relationship ending, and to see the digital artefacts you discuss if possible. The interview will take place in your home environment in order to allow you access to any of your digital artefacts that we talk about. With your permission the interview will be audio-recorded.

Benefits of Participation
You will be involved in research that aims to generate new understandings about the way that people live their lives online. The researcher hopes that the experience of contributing your ideas and experiences to the study will be enjoyable for you.

TIME COMMITMENT
The time commitment for this interview will be approximately one hour.

RISKS
The researcher has minimised the possibility of risk from this study. As you will be discussing the end of your previous relationships, there is the potential for you to feel quite emotional. Remember, if at any point you wish to take a break, you can do so. The researcher will make sure that you are given the opportunity to take breaks, and will suggest taking breaks from the interview if he thinks it would be beneficial for you. Additionally, you can decide not to answer any questions that you do not want to answer.

TERMINATION OF PARTICIPATION
Participation in the study is entirely voluntary. If you choose to take part, you will be asked to sign a Consent Form. You will be given a copy of this Information Sheet and the Consent Form to keep. If you do not wish to carry on with the research you can withdraw at any time, without giving a reason. If you decide to withdraw, the information we hold on you relating to the research will be destroyed.

CONFIDENTIALITY/ANONYMITY
Your privacy will be protected at all times. Any personal data that will be collected about you will not be used to identify you. Any data that could identify you as a participant will be stored in a password protected file, or a locked filing cabinet, and will only be available to the researcher.

In the event of any publications, all material used will be anonymised, and no links will be made to your identity. If you choose to give the researcher access to any digital artefacts discussed during the interview, any links to your identity via the artefact will be obscured. Your name will not be associated with any artefacts that are used in publications.

Your contact details (e.g. name, email address, telephone number) may be requested for communications related to your participation in the study, but will be kept confidential.

FOR FURTHER INFORMATION ABOUT THIS RESEARCH STUDY
Mr Daniel Herron, PhD Student
Duncan of Jordanstone College of Art and Design
University of Dundee
Email: dherron@dundee.ac.uk
Telephone: (01382) 386 539

ALTERNATIVELY, YOU CAN CONTACT THE RESEARCHER'S SUPERVISOR
Dr Wendy Moncur, Reader in Socio-Digital Interaction
University of Dundee
Email: w.moncur@dundee.ac.uk
Telephone: (01382) 386 538

B.2 CONSENT FORM

Consent Form

Digital Break Up, Separation, and Divorce

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I have had the opportunity to ask questions and they have been answered acceptably. ☐
- I understand that my participant in this study is voluntary, and I am free to withdraw from the study at any time, without giving a reason. If I withdraw, all data collected from me will be excluded from the study and (where possible) deleted immediately. ☐
- I confirm that I am 18 years of age or older. ☐
- I understand that the data (i.e. recordings, personal information) collected for this project will be stored in a secure University location, in accordance with the Data Protection Act 1998, and will be available to the research team exclusively. ☐
- I understand that the information that I give my only be used anonymously (without my name) in research dissemination (e.g. in published papers and conference presentations). ☐

Participant Signature: _____

Participant Name (in capitals): _____

Researcher Signature: _____

Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:
email: dherron@dundee.ac.uk
phone: (01382) 386 539

You may also contact either of the research supervisors, **Dr Wendy Moncur** or **Professor Elise van den Hoven**, with any questions or complaints regarding this study:

Dr Wendy Moncur, Reader
University of Dundee
email: wmoncur@dundee.ac.uk

Professor Elise van den Hoven
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

B.3 AUDIO CONSENT FORM

Audio Consent Form

Digital Break Up, Separation, and Divorce

The study that you are about to take part in will be audio recorded in order to allow the researcher to talk freely without having to take notes. Please read through and tick the statements below where applicable, and if you consent to having this session audio recorded, please sign this form.

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I understand that this session will be audio recorded in order to allow the researchers to review it at a later time. ☐
- I agree to have this interview audio recorded. ☐

Participant Signature: _____

Participant Name (in capitals): _____

Researcher Signature: _____

Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:
email: dherron@dundee.ac.uk
phone: (01382) 386 539

You may also contact either of the research supervisors, **Dr Wendy Moncur** or **Professor Elise van den Hoven**, with any questions or complaints regarding this study:

Dr Wendy Moncur, Reader
University of Dundee
email: wmoncur@dundee.ac.uk

Professor Elise van den Hoven
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

B.4 Discussion Guide

Interview Guide: Digital Separations

Notes

This Interview Guide contains the main points for the research to cover as well as the main questions that will be asked of participants during this study. As these are semi-structured interviews, topics may arise during the course of the interviews that are of interest to the researcher, but not covered on this Interview Guide; as such, questions may deviate from the guide depending on the information given by participants.

Additionally, this Interview Guide has been split up into 5 different sections:

- Introduction
- Establishing Background
- Main Content
- Winding Down
- Ending

The aim of the Introduction is to get participants to read through the paperwork and prepare to start the interview. The Establishing Background section will be used to establish trust between the researcher and the participant, and to gently ease them in to talking about their relationships.

The Main Content of the interviews focusses on gathering required data for the study. This is where the more intense questions and discussion will take place. The Winding Down section, where the researcher will ask questions that are useful to know the answers to, but less intense or stressful for participants to answer than questions from the previous section. Finally there is the Ending, where the researcher will debrief the participant, giving them the opportunity to ask any other questions or say anything else they want to before they leave.

Introduction

Hi _____, thanks for agreeing to take part in this interview!

My name is Daniel, I'm a PhD student at DJCAD, and the project that I'm working on is called Digital Separations. The project is about understanding how a romantic relationship ending translates across to the digital space, like on social networking sites, and how, if possible, technology can help people during and after breakups.

I would like you to read through this Information Sheet, and if you have any questions, don't hesitate to ask **[PAUSE to read IS, give time to answer questions]**. If you don't have any more questions, I'm going to ask you to take a look at this Consent Form, read through it and again ask me any questions you have **[PAUSE to read CF, give time for questions]**. When you're ready to continue, just fill out the form and sign it **[PAUSE to sign CF]**.

Before we start I just want to remind you that you can leave any questions that you don't want to answer. Feel free to snack, and let me know if you want to take a break for whatever reason. I'll try to stop around halfway through just to make sure that you have a few minutes break to use the toilet, etc.

[START RECORDING]

Establishing Background

So to start, I would like to find out a bit about any significant relationships that you've been in; have you been in any significant relationships? How many?

FOR CLARIFICATION (IF REQUIRED): the word significant, in this context, means important to YOU, e.g.:

- **First relationship**
- **Relationship that lasted the longest**
- **Relationship that was the most serious**

What was the relationship like?

- How did you meet?
- How long did it last?
- Did you live together?
    - If yes, for how long?
    - If no, did you live close, or far apart?

Looking back, if you had to describe the relationship in one word, what would that word be?

Can you tell me a bit about why you broke up?

- How did the breakup happen?
- Who broke up with who?

Main Content

Within this (these) relationship(s), can you think of 3 digital "things" or artefacts that were important to you?

- What are they?
- Where are they?
    - Were they somewhere different during the relationship?
- Can I see them?
    - If not because they were deleted:
        - Why were they deleted?
        - Who deleted them?
        - When were they deleted?
- What are the stories behind these three things?
- Do you ever go and look at these things now?

- Do you consider any of them to still be important in your life?

FOR CLARIFICATION (IF REQUIRED): digital "things" can be any of the following:

- **Digital photos**
- **Videos**
- **Facebook Status**
- **Tweets**
- **Tumblr Posts**
- **Instagram Images**
- **Chat Histories**

Who were the people that created each of these things? For example, who took the video, or posted the status, or tweeted the tweet?

- During your relationship, who had access to the artefacts?
    - Was the artefact ever shared? If so, who shared it?
    - Did your partner ever share it?
    - *[if image]* Was the artefact ever used as a profile picture?
    - *[if image]* Did your partner ever use the image as a profile picture?
- Who has access to these artefacts as of this moment?

Can you think of any digital artefacts that your perception of has changed since the end of your relationship?

FOR CLARIFICATION (IF REQUIRED): artefacts that were looked on positive during the relationship that now are negative in some way, or vice versa

---

Can you describe how your ex-partner treated their digital artefacts during your relationship?

- What about how they treated them after the relationship ended?
- How did you react to what they did or did not do?

Winding Down

What happened to the less significant digital artefacts from your relationship after it ended?

FOR CLARIFICATION (IF REQUIRED): less significant, in this context, means LESS important to YOU, e.g.:

- **Facebook status such as "Staying in to watch a movie with my SO!"**

- Where they kept?
- Deleted?
- Ignored?
- Hidden?

What about artefacts where your relationship was not the focus, but you and your ex-partner featured as a couple?

- For example, a video of a friend's birthday party that you both attended together.
- Where they kept?
- Deleted?
- Ignored?
- Hidden?

Have you ever had any friends that have had positive or negative experiences concerning digital materials with ex-partners in the wake of a breakup?

And finally, would you say you learned any lessons from your experiences with ex-partners and digital artefacts from your relationships?

- Is there anything you would do or not do in the future?

Ending

Thank you very much for taking the time to do this interview, I really appreciate it! All of the stories you've told me and the answers you've given me will really help me with my work.

If you would like to see the results of this research, please give me a contact email address that I can use. I'll send out the details of my results when I have collated them, along with a summary of what the project is about!

Before we finish, do you have any more questions for me, or is there anything else you would like to say?

APPENDIX C.

STUDY 2: RESEARCH MATERIALS

This appendix contains study materials used during the research as documented in Chapter 5 (Digitally Decoupling and Disentangling Post-Break Up).

C.1 INFORMATION SHEET

Information Sheet

Digital Break Up, Separation, and Divorce

Invitation to Take Part in a Research Study

We would like you to take part in a study (Digital Break Up, Separation, and Divorce) led by Daniel Herron, a PhD Student at the University of Dundee and the University of Technology Sydney. Before deciding whether or not you would like to take part, we would like to explain to you why the study is taking place, and what it would involve for you. Please take time to read the following information and discuss it with the researcher if you wish. The researcher is happy to answer any questions or provide more information if asked.

Purpose of the Research Study

With the introduction (and growing popularity) smartphones and Social Networking Sites (SNSs) such as Facebook over the last decade, the average Internet user has found that their virtual and physical lives have become more intertwined. Over the course of a romantic relationship, individuals create and collect large numbers of digital possessions (photos, videos, text messages, emails, chat histories, audio recordings, music files), but what happens to those digital possessions if the relationship comes to an end? The purpose of this project is to explore what happens in a digital context when individuals experience a relationship break up, and to see how technology might be able to support individuals doing so.

What is Involved in Participating in the Study?

If you choose to take part in this study you will initially be asked to fill out a Demographic Questionnaire.

You will then be asked to take part in a Matching Task; matching digital possessions relating to a past romantic relationship to different types of digital possessions (for example, a digital photograph, or an audio clip). You will be asked to speak aloud what you are thinking as you go through the process of selecting your possessions. You will be asked to reflect on what the possession means to you, as well as how you used it before and after the relationship ended.

You will also be asked to take part in a short follow-up interview, where you will be invited to discuss how technology could be better employed to support your experiences, and to reflect on the process of searching through your digital possessions.

Benefits of Participation

You will be involved in research that aims to generate new understandings about the way that people live their lives online. The researcher hopes that the experience of contributing your ideas and experiences to the study will be enjoyable for you.

Time Commitment

The time commitment for this study will be approximately one hour.

Risks

The researcher has minimised the possibility of risk from this study. As you will be discussing the end of your previous relationship, there is the potential for you to feel strong emotions. Remember, if at any point you wish to take a break, you can do so. The research will make sure that you are given the opportunity to take breaks, and will suggest taking breaks from the session if he thinks it would be beneficial for you. Additionally, you can decide not to answer any questions that you do not wish to answer.

Termination of Participation

Participation in this study is entirely voluntary. If you choose to take part, you will be asked to sign a Consent Form and a Video Consent Form. You will be given a copy of this Information Sheet, the Consent Form, and the Video Consent Form to keep. If you do not wish to carry on with the research you can withdraw at any time without giving a reason. If you decide to withdraw, the information we hold on you relating to the research will be destroyed.

Confidentiality and Anonymity

Your privacy will be protected at all times. Any personal data that will be collected about you will not be used to identify you. Any data that could identify you as a participant will be stored in a password protected file, or a locked filing cabinet, and will only be available to the researcher.

In the event of any publication, all materials used will be anonymised, and no links will be made to your identity. If you choose to give the researcher access to any digital possessions during the study, any links to your identity will be obscured. Your name will not be associated with any possessions that are used in publications.

Your contact details (e.g. name, email address, telephone number) may be requested for communications relation to your participant in the study, but will be kept confidential.

For further information regarding this study, please contact:

Mr Daniel Herron
Duncan of Jordanstone College of Art & Design
University of Dundee
email: dherron@dundee.ac.uk
phone: (01382) 386 539

Alternatively, you could contact either of the project supervisors for more information about this work, or if you wish to register a complaint:

Dr Wendy Moncur, Reader
Duncan of Jordanstone College of Art & Design
University of Dundee
email: wmoncur@dundee.ac.uk
phone: (01382) 386538

Professor Elise van den Hoven
Faculty of Engineering and IT
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

C.2 CONSENT FORM

Consent Form

Digital Break Up, Separation, and Divorce

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I have had the opportunity to ask questions and they have been answered acceptably. ☐
- I understand that my participant in this study is voluntary, and I am free to withdraw from the study at any time, without giving a reason. If I withdraw, all data collected from me will be excluded from the study and (where possible) deleted immediately. ☐
- I confirm that I am 18 years of age or older. ☐
- I understand that the data (i.e. recordings, personal information) collected for this project will be stored in a secure University location, in accordance with the Data Protection Act 1998, and will be available to the research team exclusively. ☐
- I understand that the information that I give my only be used anonymously (without my name) in research dissemination (e.g. in published papers and conference presentations). ☐

Participant Signature: _____

Participant Name (in capitals): _____

Researcher Signature: _____

Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:
email: dherron@dundee.ac.uk
phone: (01382) 386 539

You may also contact either of the research supervisors, **Dr Wendy Moncur** or **Professor Elise van den Hoven**, with any questions or complaints regarding this study:

Dr Wendy Moncur, Reader
University of Dundee
email: wmoncur@dundee.ac.uk

Professor Elise van den Hoven
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

C.3 Audio Consent Form

Audio Consent Form

Digital Break Up, Separation, and Divorce

The study that you are about to take part in will be audio recorded in order to allow the researcher to talk freely without having to take notes. Please read through and tick the statements below where applicable, and if you consent to having this session audio recorded, please sign this form.

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I understand that this session will be audio recorded in order to allow the researchers to review it at a later time. ☐
- I agree to have this interview audio recorded. ☐

Participant Signature: _____

Participant Name (in capitals): _____

Researcher Signature: _____

Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:
email: dherron@dundee.ac.uk
phone: (01382) 386 539

You may also contact either of the research supervisors, **Dr Wendy Moncur** or **Professor Elise van den Hoven**, with any questions or complaints regarding this study:

Dr Wendy Moncur, Reader
University of Dundee
email: wmoncur@dundee.ac.uk

Professor Elise van den Hoven
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

C.4 Demographic Questionnaire

Demographics Questionnaire

Digital Break Up, Separation, and Divorce

Name:

Age:

Gender:

Nationality:

Duration of the Past Relationship Discussed:

Type of Past Relationship:

Currently in a Relationship:

Yes ☐ No ☐

Type of Current Relationship:

Length of Current Relationship:

Time Since Breakup:

Highest Level of Education:

High School ☐ University (Undergraduate): ☐

College ☐ University (Postgraduate): ☐

Current Job:

C.5 Discussion Guide

SESSION GUIDE

STUDY 2

Research Aims

1. How do individuals use their digital possessions during a relationship?

2. In what way does that change when the relationship ends?
    a. Does this differ between different types of digital possessions?

3. Can change in use after a break up be used to inform/improve curation?
    a. Can we design curation around this evolving context of use?

4. What tools (if any) did individuals use to curate after their break up?
    a. What functionality do they wish they had available to them at the time?

Preamble

Explanation of Study

Thanks for agreeing to take part in this study! I would like to give you a bit of an overview of what we're going to be doing today, and then I've got a few forms for you to read through and sign before we get started.

In today's session I want you to take part in a matching task; I have a list of different types of digital possessions, and I want you to choose a specific digital possession from a past relationship that matches that type. I want you to talk me through what you're thinking when you're choosing the digital possessions, and I tell me what the possessions mean to you, as well as how you used it during the relationship and after the relationship ended.

Afterwards I'd like to ask you a few questions about your break up and what it was like to take part in this study.

Information Sheet

Read the information sheet and if you have any questions, don't hesitate to ask them.

Consent Form and Audio Consent Form

If you have no more questions and are happy to take part in the study, I have two forms for you to sign; a consent form to confirm that you want to take part, and an audio consent form that states you're okay with me recording the session.

Demographic Questionnaire

I also have a short demographic questionnaire that I would like you to fill in – just to get some details from you.

Matching Task

Before we start on the main task, I would like to find out a bit about the relationship that we'll be talking about today!

- What was the relationship like? Could you tell me a bit about it?
    - How did you meet?
    - How long did it last?
    - Was it a serious relationship? Why?

- Looking back, if you had to describe the relationship in one word, what would it be?

- Could you tell me a bit about how the relationship ended?
    - Why did you break up?
    - How did it happen?
    - Who broke up with who?

The following list shows 9 different types of digital possessions. I want to go through the list with you and for you to choose **3 or 4 different types of meaningful digital possession from your past relationship** for us to discuss. I have some follow-up questions for each possession, so we'll do them one at a time.

While searching through your digital possessions, I would like you to speak aloud what you're thinking as you try to make a choice.

1. Digital photograph or digital photo album;
2. Social media post;
3. Video clip;
4. Chat history;
5. Audio file;
6. Email;
7. Account that you shared ownership of;
8. Account that you shared the use of;
9. Text message;
10. Other.

For each possession:

- Tell me a bit about this digital possession – what's the story behind it?
- In what way did you use this digital possession during your relationship?
    - When you look at this digital possession, what comes to mind?
- Did that change after your relationship ended?
    - How is it used now?
- If the possession was physical – printed on paper, stored on a CD – do you think this would be different?

Follow-up Interview

1. Since the break up, have you purposefully looked at or accessed the digital possessions we discussed before today?
   If yes:
   - In terms of each digital possession, what made you look at them before now?
   - How did it make you feel compared to when you looked at them today?

   If no:
   - Why have you not looked at them before now?
   - How did it feel looking through the possessions today?

2. When you broke up with your ex-partner, did you feel that you had the means to deal with your digital possessions from the relationship?
   If yes:
   - In what way did you deal with them?
   - Did you use any particular technology to do so?
     - Did you use different technologies for different possessions?
   - What other kind of action would you have liked to be able to carry out regarding these digital possessions?

   If no:
   - What would have been useful for you at the time?
   - What types of things would you have liked to be able to do to these digital possessions?

APPENDIX D.

STUDY 3: RESEARCH MATERIALS

This appendix contains study materials used during the research as documented in Chapter 6 (Limitations of Technology in Curation and Management of Digital Possessions).

D.1 INFORMATION SHEET

Information Sheet

Digital Break Up, Separation, and Divorce

Invitation to Take Part in a Research Study

We would like you to take part in a study (Digital Break Up, Separation, and Divorce) led by Daniel Herron, a PhD Student at the University of Dundee and the University of Technology Sydney. Before deciding whether or not you would like to take part, we would like to explain to you why the study is taking place, and what it would involve for you. Please take time to read the following information and discuss it with the researcher if you wish. The researcher is happy to answer any questions or provide more information if asked.

Purpose of the Research Study

With the introduction (and growing popularity) smartphones and Social Networking Sites (SNSs) such as Facebook over the last decade, the average Internet user has found that their virtual and physical lives have become more intertwined. Over the course of a romantic relationship, individuals create and collect large numbers of digital possessions (photos, videos, text messages, emails, chat histories, audio recordings, music files), but what happens to those digital possessions if the relationship comes to an end? The purpose of this project is to explore what happens in a digital context when individuals experience a relationship break up, and to see how technology might be able to support individuals doing so.

What is Involved in Participating in the Study?

If you choose to take part in this study you will initially be asked to fill out a Consent Form, Audio Consent Form, and Demographic Questionnaire.

You will then be asked to take part in an interview. During the interview you will be asked to share stories of times when technology failed you in dealing with your digital possessions after a relationship break up.

Benefits of Participation

You will be involved in research that aims to generate new understandings about the way that people live their lives online. The researcher hopes that the

experience of contributing your ideas and experiences to the study will be enjoyable for you.

Time Commitment

The time commitment for this study will be approximately one hour.

Risks

The researcher has minimised the possibility of risk from this study. As you will be discussing the end of your previous relationship, there is the potential for you to feel strong emotions. Remember, if at any point you wish to take a break, you can do so. The research will make sure that you are given the opportunity to take breaks, and will suggest taking breaks from the session if he thinks it would be beneficial for you. Additionally, you can decide not to answer any questions that you do not wish to answer.

Termination of Participation

Participation in this study is entirely voluntary. If you choose to take part, you will be asked to sign a Consent Form and an Audio Consent Form. You will be given a copy of this Information Sheet, the Consent Form, and the Audio Consent Form to keep. If you do not wish to carry on with the research you can withdraw at any time without giving a reason. If you decide to withdraw, the information we hold on you relating to the research will be destroyed.

Confidentiality and Anonymity

Your privacy will be protected at all times. Any personal data that will be collected about you will not be used to identify you. Any data that could identify you as a participant will be stored in a password protected file, or a locked filing cabinet, and will only be available to the researcher.

In the event of any publication, all materials used will be anonymised, and no links will be made to your identity. If you choose to give the researcher access to any digital possessions during the study, any links to your identity will be obscured. Your name will not be associated with any possessions that are used in publications.

Your contact details (e.g. name, email address, telephone number) may be requested for communications relation to your participant in the study, but will be kept confidential.

For further information regarding this study, please contact:

Mr Daniel Herron
Duncan of Jordanstone College of Art & Design/Faculty of Engineering and IT
University of Dundee/University of Technology Sydney
email: dherron@dundee.ac.uk
phone: (01382) 386 539

Alternatively, you could contact either of the project supervisors for more information about this work, or if you wish to register a complaint:

Professor Wendy Moncur, FRSA
University of Dundee
email: wmoncur@dundee.ac.uk
phone: (01382) 386538

Professor Elise van den Hoven MTD
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

D.2 Consent Form

Consent Form

Digital Break Up, Separation, and Divorce

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I have had the opportunity to ask questions and they have been answered acceptably. ☐
- I understand that my participant in this study is voluntary, and I am free to withdraw from the study at any time, without giving a reason. If I withdraw, all data collected from me will be excluded from the study and (where possible) deleted immediately. ☐
- I confirm that I am 18 years of age or older. ☐
- I understand that the data (i.e. recordings, personal information) collected for this project will be stored in a secure University location, in accordance with the Data Protection Act 1998, and will be available to the research team exclusively. ☐
- I understand that the information that I give my only be used anonymously (without my name) in research dissemination (e.g. in published papers and conference presentations). ☐

Participant Signature: _____

Participant Name (in capitals): _____

Researcher Signature: _____

Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:

email: dherron@dundee.ac.uk
phone: (01382) 386 539

D.3 Audio Consent Form

Audio Consent Form

Digital Break Up, Separation, and Divorce

The study that you are about to take part in will be audio recorded in order to allow the researcher to talk freely without having to take notes. Please read through and tick the statements below where applicable, and if you consent to having this session audio recorded, please sign this form.

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I understand that this session will be audio recorded in order to allow the researchers to review it at a later time. ☐
- I agree to have this interview audio recorded. ☐

Participant Signature: _____
Participant Name (in capitals): _____

Researcher Signature: _____
Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:

email: dherron@dundee.ac.uk
phone: (01382) 386 539

You may also contact either of the research supervisors, **Professor Wendy Moncur** or **Professor Elise van den Hoven**, with any questions or complaints regarding this study:

Professor Wendy Moncur, FRSA
University of Dundee
email: wmoncur@dundee.ac.uk

Professor Elise van den Hoven MTD
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

D.4 DEMOGRAPHIC QUESTIONNAIRE

Demographics Questionnaire

Digital Break Up, Separation, and Divorce

Name:

Age:

Gender:

Nationality:

Duration of the Past Relationship Discussed:

Type of Past Relationship:

Time Since Breakup:

Currently in a Relationship:

Yes ☐ No ☐

Type of Current Relationship:

Length of Current Relationship:

Highest Level of Education:

High School ☐ University (Undergraduate): ☐

College ☐ University (Postgraduate): ☐

Current Job:

D.5 Discussion Guide

SESSION GUIDE

STUDY 3

Preamble

Explanation of Study

Thanks for agreeing to take part in this study! I would like to give you a bit of an overview of what we're going to be doing today, and then I've got a few forms for you to read through and sign before we get started.

Information Sheet

Read the information sheet and if you have any questions, don't hesitate to ask them.

Consent Form and Audio Consent Form

If you have no more questions and are happy to take part in the study, I have two forms for you to sign; a consent form to confirm that you want to take part, and an audio consent form that states you're okay with me recording the session.

Demographic Questionnaire

I also have a short demographic questionnaire that I would like you to fill in – just to get some details from you.

Interview

Introduction

Before we start on the interview, I would like to find out a bit about the relationship that we'll be talking about today!

- What was the relationship like? Could you tell me a bit about it?
    - How did you meet?
    - How long did it last?
    - Was it a serious relationship? Why?

- Looking back, if you had to describe the relationship in one word, what would it be?

- Could you tell me a bit about how the relationship ended?
    - Why did you break up?
    - How did it happen?
    - Who broke up with who?

Story Telling

The main point of this interview is to hear stories from you about times that technology let you down when it came to managing your digital possessions after a break up.

Things to think about to jog your memory:

- Tell me about any times where you came across something from the relationship unexpectedly, and how you dealt (or didn't deal) with it!
- After breaking up, what were the things that you wanted to get rid of, but couldn't?
- After the break up, what were the things that you wanted to save or keep, but couldn't?
- What actions do you wish you had been able to take online when it comes to your digital possessions, that you can't currently do?

Digital possessions include:

1. Digital photograph or digital photo album;
2. Social media post;
3. Video clip;
4. Chat history;
5. Audio file;
6. Email;
7. Account that you shared ownership of;
8. Account that you shared the use of;
9. Text message;
10. Other.

APPENDIX E.

STUDY 4: RESEARCH MATERIALS

This appendix contains study materials used during the research as documented in Chapter 7 (Taking Action Through Interaction).

E.1 Information Sheet: Design Workshop

Information Sheet

Digital Break Up, Separation, and Divorce

Invitation to Take Part in a Research Study

We would like you to take part in a study (Digital Break Up, Separation, and Divorce) led by Daniel Herron, a PhD Student at the University of Dundee and the University of Technology Sydney. Before deciding whether or not you would like to take part, we would like to explain to you why the study is taking place, and what it would involve for you. Please take time to read the following information and discuss it with the researcher if you wish. The researcher is happy to answer any questions or provide more information if asked.

Purpose of the Research Study

With the introduction (and growing popularity) smartphones and Social Networking Sites (SNSs) such as Facebook over the last decade, the average Internet user has found that their virtual and physical lives have become more intertwined. Over the course of a romantic relationship, individuals create and collect large numbers of digital possessions (photos, videos, text messages, emails, chat histories, audio recordings, music files), but what happens to those digital possessions if the relationship comes to an end? The purpose of this project is to explore what happens in a digital context when individuals experience a relationship break up, and to see how technology might be able to support individuals doing so.

What is Involved in Participating in the Study?

If you choose to take part in this study you will initially be asked to fill out a Consent Form, Audio Consent Form, and Demographic Questionnaire.

You will then be invited to take part in a design workshop. As a group, you will work with other participants to design new ways of interacting with digital things as part of helping people manage their photos, videos, chat histories, emails, and social media posts after a relationship break up.

This workshop will take place at the University of Dundee. You will be given potential dates and times in advance, and the date and time that works for the most participants will be selected.

Benefits of Participation

You will be involved in research that aims to generate new understandings about the way that people live their lives online. The researcher hopes that the experience of contributing your ideas and experiences to the study will be enjoyable for you.

Time Commitment

The time commitment for this study will be between 1.5 to 2 hours.

Risks

You will be asked to talk about concepts related to the end of romantic relationships. If you any of the content in this design workshop resonates with you personally, you will be more than welcome to take breaks, or to withdraw from the design workshop. The researcher will make sure that you are given the opportunity to take a break during the session, and will suggest taking breaks from the session if he thinks it would be beneficial for you. Additionally, you can decide not to answer any questions that you do not wish to answer.

Termination of Participation

Participation in this study is entirely voluntary. If you choose to take part, you will be asked to sign a Consent Form and an Audio Consent Form. You will be given a copy of this Information Sheet, the Consent Form, and the Audio Consent Form to keep. If you do not wish to carry on with the research you can withdraw at any time without giving a reason. If you decide to withdraw, the information we hold on you relating to the research will be destroyed.

Confidentiality and Anonymity

Your privacy will be protected at all times. Any personal data that will be collected about you will not be used to identify you. Any data that could identify you as a participant will be stored in a password protected file, or a locked filing cabinet, and will only be available to the researcher.

In the event of any publication, all materials used will be anonymised, and no links will be made to your identity. If you choose to give the researcher access to any digital possessions during the study, any links to your identity will be obscured. Your name will not be associated with any possessions that are used in publications.

Your contact details (e.g. name, email address, telephone number) may be requested for communications relation to your participant in the study, but will be kept confidential.

For further information regarding this study, please contact:

Mr Daniel Herron
Duncan of Jordanstone College of Art & Design/Faculty of Engineering and IT
University of Dundee/University of Technology Sydney
email: dherron@dundee.ac.uk
phone: (01382) 386 539

Alternatively, you could contact either of the project supervisors for more information about this work, or if you wish to register a complaint:

Professor Wendy Moncur, FRSA
University of Dundee
email: wmoncur@dundee.ac.uk
phone: (01382) 386538

Professor Elise van den Hoven MTD
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

E.2 Information Sheet: Evaluation Sessions

Information Sheet

Digital Break Up, Separation, and Divorce

Invitation to Take Part in a Research Study

We would like you to take part in a study (Digital Break Up, Separation, and Divorce) led by Daniel Herron, a PhD Student at the University of Dundee and the University of Technology Sydney. Before deciding whether or not you would like to take part, we would like to explain to you why the study is taking place, and what it would involve for you. Please take time to read the following information and discuss it with the researcher if you wish. The researcher is happy to answer any questions or provide more information if asked.

Purpose of the Research Study

With the introduction (and growing popularity) of smartphones and Social Networking Sites (SNSs) such as Facebook over the last decade, the average Internet user has found that their virtual and physical lives have become more intertwined. Over the course of a romantic relationship, individuals create and collect large numbers of digital possessions (photos, videos, text messages, emails, chat histories, audio recordings, music files), but what happens to those digital possessions if the relationship comes to an end? The purpose of this project is to explore what happens in a digital context when individuals experience a relationship break up, and to see how technology might be able to support individuals doing so.

What is Involved in Participating in the Study?

The purpose of this project is to evaluate prototyped features of an app that is aimed at helping people manage their digital possessions after a break up.

If you would like to take part in this study, you will be asked to read this information sheet, be given the opportunity to ask any questions you have, and (should you want to continue) give consent by signing consent forms for the study. In the interview, you will be asked to share the store of a past romantic relationship you have been in that has ended, and then asked for feedback on a number of video prototypes.

The University Research Ethics Committee of the University of Dundee has reviewed and approved this research study.

Benefits of Participation
You will be involved in research that aims to generate new understandings about the way that people live their lives online. The researcher hopes that the experience of contributing your ideas and experiences to the study will be enjoyable for you.

Time Commitment
From reading this information sheet finishing the interview sessions should take approximately one hour.

Termination of Participation
Participation in this study is entirely voluntary. If you choose to take part, you will be asked to consent to taking part. If you do not wish to carry on with the research you can withdraw at any time without giving a reason. If you decide to withdraw, the information we hold on you relating to the research will be destroyed. In the event that it is not possible to withdraw your data from the study, there will be no connection between you and your data; you will be unidentifiable as a participant based on any of the data contributed before your withdrawal.

Confidentiality and Anonymity
Your privacy will be protected at all times. Any personal data that will be collected about you will not be used to identify you. Any data that could identify you as a participant will be stored in a password protected file, or a locked filing cabinet, and will only be available to the researcher.

In the event of any publication, all materials used will be anonymised, and no links will be made to your identity. If you choose to give the researcher access to any digital possessions during the study, any links to your identity will be obscured. Your name will not be associated with any possessions that are used in publications.

For further information regarding this study, please contact:

Mr Daniel Herron
Duncan of Jordanstone College of Art & Design/Faculty of Engineering and IT
University of Dundee/University of Technology Sydney
email: dherron@dundee.ac.uk
phone: (01382) 386 539

The University Research Ethics Committee of the University of Dundee has reviewed and approved this research study.

Alternatively, you could contact either of the project supervisors for more information about this work, or if you wish to register a complaint:

Professor Wendy Moncur, FRSA
University of Dundee
email: wmoncur@dundee.ac.uk
phone: (01382) 386538

Professor Elise van den Hoven MTD
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

The University Research Ethics Committee of the University of Dundee has reviewed and approved this research study.

E.3 Consent Form

Consent Form

Digital Break Up, Separation, and Divorce

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I have had the opportunity to ask questions and they have been answered acceptably. ☐
- I understand that my participant in this study is voluntary, and I am free to withdraw from the study at any time, without giving a reason. If I withdraw, all data collected from me will be excluded from the study and (where possible) deleted immediately. ☐
- I confirm that I am 18 years of age or older. ☐
- I understand that the data (i.e. recordings, personal information) collected for this project will be stored in a secure University location, in accordance with the Data Protection Act 1998, and will be available to the research team exclusively. ☐
- I understand that the information that I give my only be used anonymously (without my name) in research dissemination (e.g. in published papers and conference presentations). ☐

Participant Signature: _____

Participant Name (in capitals): _____

Researcher Signature: _____

Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:

email: dherron@dundee.ac.uk
phone: (01382) 386 539

E.4 AUDIO CONSENT FORM

Audio Consent Form

Digital Break Up, Separation, and Divorce

The study that you are about to take part in will be audio recorded in order to allow the researcher to talk freely without having to take notes. Please read through and tick the statements below where applicable, and if you consent to having this session audio recorded, please sign this form.

Please tick (✓) as applicable:

- I confirm that I have read and understood the Information Sheet about the purpose of the study, and what taking part will mean for me. ☐
- I understand that this session will be audio recorded in order to allow the researchers to review it at a later time. ☐
- I agree to have this interview audio recorded. ☐

Participant Signature: _____
Participant Name (in capitals): _____

Researcher Signature: _____
Date: _____

Please feel free to contact the researcher, **Daniel Herron**, if you have any further questions about this study:

email: dherron@dundee.ac.uk
phone: (01382) 386 539

You may also contact either of the research supervisors, **Professor Wendy Moncur** or **Professor Elise van den Hoven**, with any questions or complaints regarding this study:

Professor Wendy Moncur, FRSA
University of Dundee
email: wmoncur@dundee.ac.uk

Professor Elise van den Hoven MTD
University of Technology Sydney
email: Elise.VandenHoven@uts.edu.au

E.5 DEMOGRAPHIC QUESTIONNAIRE

Demographics Questionnaire

Digital Break Up, Separation, and Divorce

Name:

Age:

Gender:

Nationality:

Duration of the Past Relationship Discussed:

Type of Past Relationship:

Time Since Breakup:

Currently in a Relationship:

Yes ☐ No ☐

Type of Current Relationship:

Length of Current Relationship:

Highest Level of Education:

High School ☐ University (Undergraduate): ☐

College ☐ University (Postgraduate): ☐

Current Job:

E.6 Design Workshop Discussion Guide

Workshop Session Guide

1. **Participants welcomed**
   Hi everyone! First off I want to say thank you to all of you for coming along and taking part. I really appreciate it! Our plan for today looks like this:

   I'm going to introduce you all to a concept I've come up with based on my research. I'll explain some terms to you, and then I'll introduce you to a Stacey, our persona for the day. The main task we'll be focusing on in this session will be looking at ways of managing Stacey's collection of digital possessions, where I will give you scenarios, and as a team, you'll edit Stacey's collection to show me what you think it should look like.

   We'll do this multiple times for multiple scenarios, and then at the end of the focus group, I'll have a few questions about what you thought of the process.

   Throughout everything you're doing today, don't worry about what is and isn't possible using current technology – be inventive, and don't worry about the mechanics of your ideas – that's my job.

   With everything that you do in this focus group, I want you to work as a group, and to think aloud – say whatever comes into your mind as you're performing the tasks, let me know your thought processes!

2. **Dimensions explained to participants:**
   So, the concepts I'm going to introduce you to today are three aspects of digital possessions that I believe we can manipulate to control how we, and other people, see our digital possessions.
   - **Time Range:** the period of time within which an individual can view digital possessions;
   - **Level of Detail:** the amount of information connected to or contained in a digital possession, on a sliding scale from incredibly vague to complete;
   - **Shared Possessions:** whether an individual includes digital possessions belonging to their ex-partner in their own collection.

3. **Participants are presented with Stacey's backstory:**
   a. Read aloud to them,
   b. Given to them on paper;

4. **Participants will be shown print-outs of Stacey's digital possessions;**
   So all of these things are Stacey's digital possessions, laid out according to this timeline of her relationship with her ex-boyfriend, Dave. Stacey's digital possessions live in lots of different places – these photos are on her phone, these posts came from Facebook, these from Instagram. This I an email she wrote to a friend, and these are conversations she had with Dave via text.

   The changes we make to Stacey's collection are applied to every digital possession in that collection, no matter what platform they are on. This means that they will be seen be different audiences: the changes to the photos stored only on Stacey's phone will likely only

be seen by Stacey. Those same changes will also effect Stacey's Facebook posts and Instagram posts, as well as her text messages and emails, although it may affect each of these types of possessions in different ways – that's up to you!

5. Participants will be asked to order and manipulate the print-outs as a group to show what they think should happen when each of the dimensions are manipulated in this way:

Task ID	Time	Level of Detail	Shared Possessions
A	X	O	O
B	O	X	O
C	O	O	X
D	X	X	O
E	X	O	X
F	O	X	X
G	X	X	X

   a) Time: Stacey has decided that she wants to only see digital possessions from when she first meets Dave, to before she starts to have doubts about the relationship.

   b) Level of Detail: Stacey wants her the Level of Detail for her digital possessions to be almost as vague as can be, so that looking at these digital possessions doesn't bring back too many painful memories.

   c) Shared Possessions: Stacey wants to include Dave's digital possessions in her collection.

   d) Time and Level of Detail: Stacey wants her digital collection's time range to begin after she broke up with Robert, and end after her holiday with Dave. For the Level of Detail, Stacey wants it to be midway between vague and complete. She doesn't want to see all the information, but she wants to see more than the digital possession at its vaguest.

   e) Time and Shared Possessions: Stacey wants to see the digital possessions from when she started at university until the end of her relationship with Dave, including Dave's possessions in her collection.

   f) Level of Detail and Shared Possessions: Stacey wants to manage her collection of digital possessions so that it includes Dave's possessions as well as her own, and where the Level of Detail is close to complete, but not fully so.

   g) Time, Level of Detail, and Shared Possessions: Finally, Stacey wants to manage her digital possessions using all three aspects. The Time Range should be from when she first met Dave until after their first date, as well as when they went on holiday, until after they met each other's' families. The Level of Detail should be such that Stacey can look back at the digital possessions without having to worry about easily connecting to Dave digitally when doing so, but she would like to include his possessions in the collection.

6. Finally, participants will be asked to evaluate the concept:
   a. What are the downsides to managing digital possessions in this way?

b. In what way do you think this way of manipulating digital possessions could be improved?

E.7 Design Workshop Materials

Stacey

Stacey is a woman who is concerned about her digital identity. She is an avid social media user, and has a collection of digital possessions from a number of sources, both relating to her most recent romantic relationship, and relating to her life in general. Stacey has just come out of a serious relationship, and has been looking back over her digital possessions and social media in light of the fact that she has broken up. She wishes that she had more control over her digital possessions, especially those related to her past relationship.

Aspects of Digital Possessions

Time Range

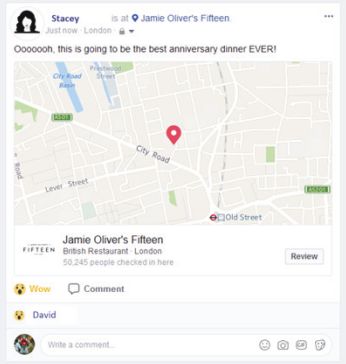
Time frame within which an individual views digital possessions.

Level of Detail

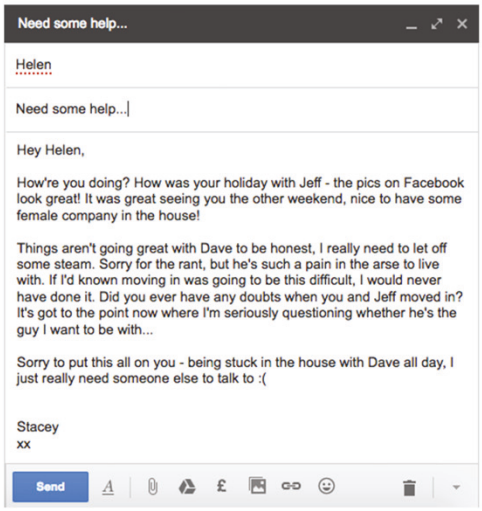
The level of detail an individual can see connected to (and also in) their digital possessions, on a scale from vague to complete.

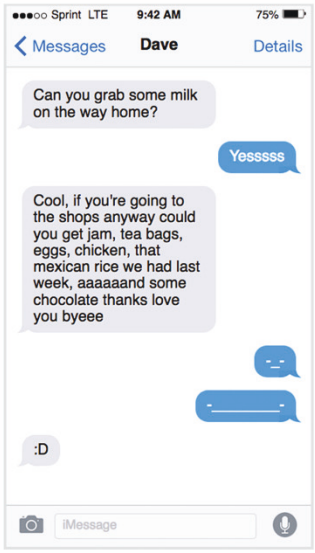
Shared Possessions

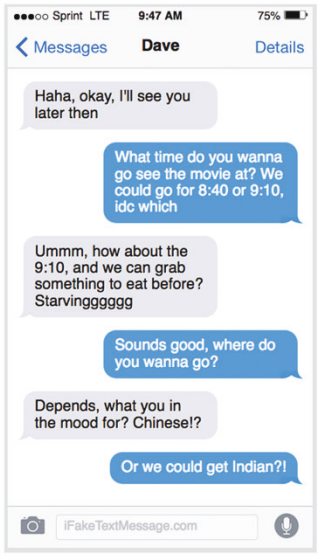
Whether or not an individual includes digital possessions belonging to an ex-partner in their collection.

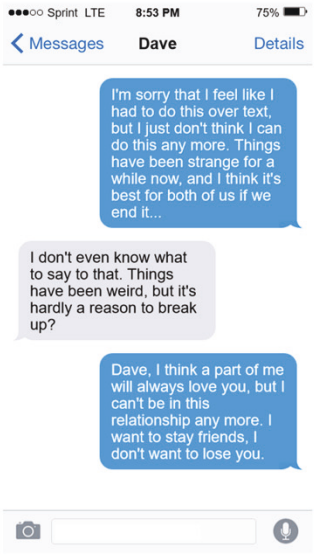

Stacey
is at Jamie Oliver's Fifteen
Just now · London
Oooooh, this is going to be the best anniversary dinner EVER!
City Road
Lever Street
Old Street
Jamie Oliver's Fifteen
British Restaurant · London
50,245 people checked in here
Review
Wow
Comment
David
Write a comment...

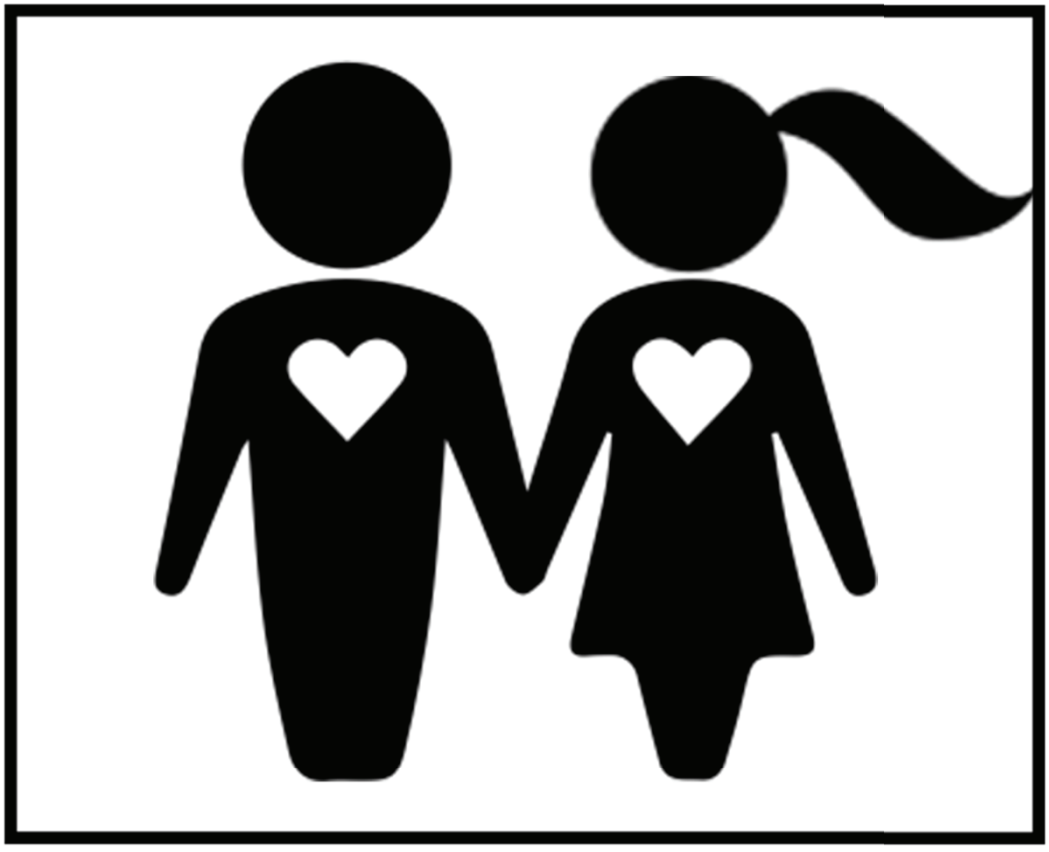

Dave
Just now
Couldn't be happier than right now - one year with Stacey, the woman I love!
Like
Comment
Write a comment...

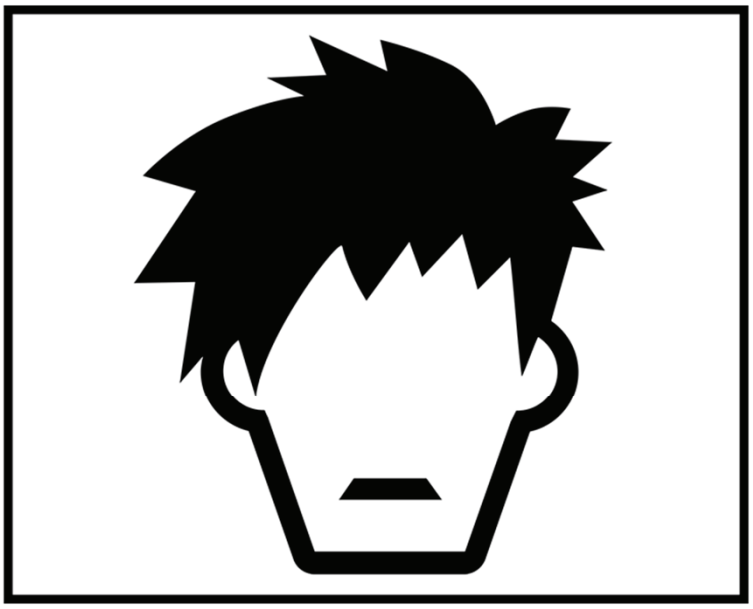

Need some help...
Helen
Need some help...
Hey Helen,
How're you doing? How was your holiday with Jeff - the pics on Facebook look great! It was great seeing you the other weekend, nice to have some female company in the house!
Things aren't going great with Dave to be honest, I really need to let off some steam. Sorry for the rant, but he's such a pain in the arse to live with. If I'd known moving in was going to be this difficult, I would never have done it. Did you ever have any doubts when you and Jeff moved in? It's got to the point now where I'm seriously questioning whether he's the guy I want to be with...
Sorry to put this all on you - being stuck in the house with Dave all day, I just really need someone else to talk to :(
Stacey
xx
Send

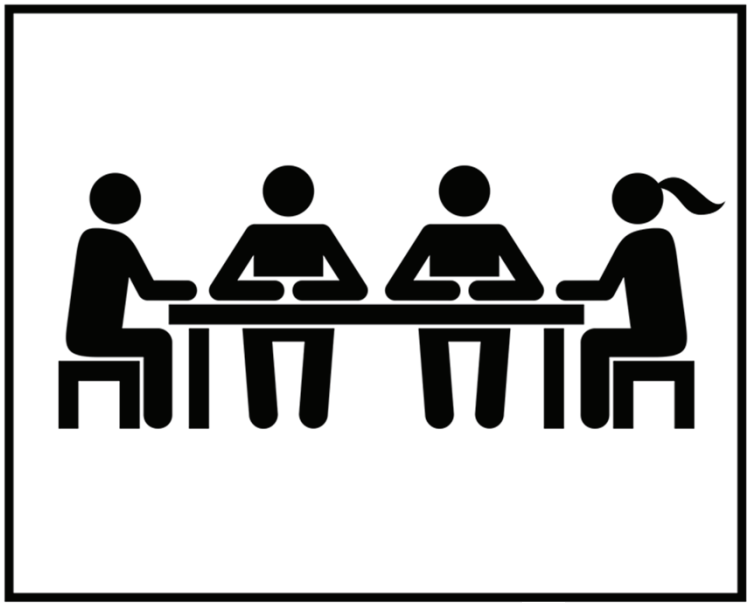

Sprint LTE
9:42 AM
75%
Messages
Dave
Details
Can you grab some milk on the way home?
Yesssss
Cool, if you're going to the shops anyway could you get jam, tea bags, eggs, chicken, that mexican rice we had last week, aaaaaand some chocolate thanks love you byeee
-_-
-_____-
:D
iMessage

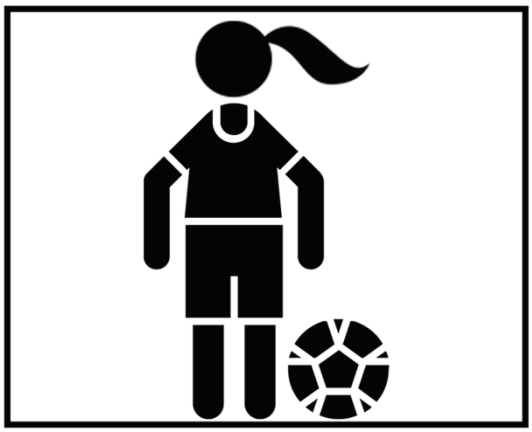

Sprint LTE
9:47 AM
75%
Messages
Dave
Details
Haha, okay, I'll see you later then
What time do you wanna go see the movie at? We could go for 8:40 or 9:10, idc which
Ummm, how about the 9:10, and we can grab something to eat before? Starvinggggggg
Sounds good, where do you wanna go?
Depends, what you in the mood for? Chinese!?
Or we could get Indian?!
iFakeTextMessage.com


Sprint LTE
8:53 PM
75%
Messages
Dave
Details
I'm sorry that I feel like I had to do this over text, but I just don't think I can do this any more. Things have been strange for a while now, and I think it's best for both of us if we end it...
I don't even know what to say to that. Things have been weird, but it's hardly a reason to break up?
Dave, I think a part of me will always love you, but I can't be in this relationship any more. I want to stay friends, I don't want to lose you.









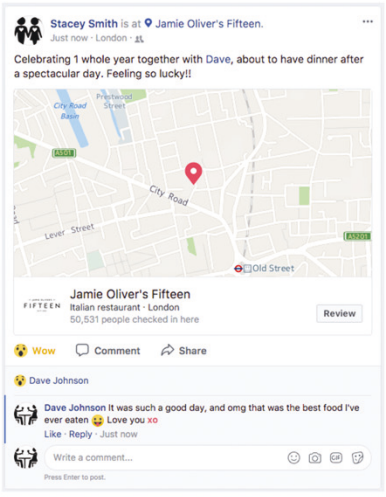

O2-UK
12:58
73%
Instagram
staceysmith132435
4 likes
staceysmith132435 Living that yoga life! #yoga #yogaeverydamnday #bendy #fitness #peaceful
View 1 comment
1 HOUR AGO


Stacey Smith is with Dave Johnson.
15 November 2016
In a Relationship with Dave Johnson
15 November 2016
Love
Comment
Share
Dave Johnson
Write a comment...
Press Enter to post.

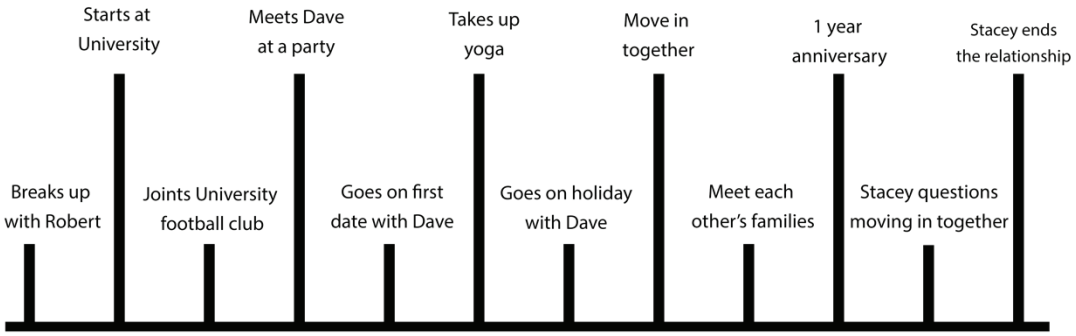

O2-UK
03:41
45%
Instagram
staceysmith132435
staceysmith132435 Guess who just decided to move in together?! #relationshipgoals #movingin #justcouplethings
10 SECONDS AGO


Stacey Smith updated her profile picture.
9 hrs
Like
Comment
Share
Write a comment...
Press Enter to post.


Dave Johnson is with Stacey Smith.
Just now
Couldn't be happier than I am right now - one year with the woman I love! Happy anniversary Stacey xo
Like
Comment
Share
Write a comment...
Press Enter to post.


Stacey Smith is at Jamie Oliver's Fifteen.
Just now · London
Celebrating 1 whole year together with Dave, about to have dinner after a spectacular day. Feeling so lucky!!
City Road
Old Street
Jamie Oliver's Fifteen
Italian restaurant · London
50,531 people checked in here
Review
Wow
Comment
Share
Dave Johnson
Dave Johnson It was such a good day, and omg that was the best food I've ever eaten Love you xo
Like · Reply · Just now
Write a comment...
Press Enter to post.

Stacey's Timeline of Events



E.6 EVALUATION SESSION DISCUSSION GUIDE

Interview Guide
STUDY FOUR

NB: This research will utilise a semi-structured interview approach; although these questions will be used to guide the sessions with participants, additional questions can and will be asked as the session unfolds.

INTRO (5 mins)

- In this session we're going to be evaluating some prototyped features of an app to help people manage their digital possessions after a break up.
- The term *digital possessions* refers to all of the different types of digital things you can have – things like photos, videos, social media posts, chat histories, text messages, emails, accounts for services like Netflix or online shops like Amazon, your login details, your location data.
- Before we take a look at the prototypes, I'd like to learn a little bit about you.

BACKGROUND (15 mins)

1) I wanted to learn a bit about one of your past relationships – a relationship where you were active on social media during it, or created digital possessions over the course of it:
    a. How did you meet?
    b. How long were you together for?
    c. What was the relationship like?
    d. Was it a serious relationship?

2) Tell me a bit about your break up:
    a. What happened?
    b. Who broke up with who?
    c. Are you still in touch at all?

3) When you and your ex broke up, what did you do with all of your digital possessions from the relationship?
    a. Did you keep any?
    b. Where there any that you specifically want to get rid of?
    c. Did you use any apps or websites to help you manage those digital possessions?

EVALUATION (25-30 mins)

We're going to take a look at the different interactions that we've prototyped to help people manage their digital possessions. I will show you a video of what each feature might look like, and I want you to react out loud – to tell me your first impressions of the prototype. I'll also have some questions that I want to ask you for each prototype.

There are three things that I want you to remember during this part of the session:

1) The prototypes I'm going to show you are for features early in the design phase, so we have time to use the feedback we get from these sessions to make our designs better – don't hold anything back, give us all your feedback, both positive and negative!

2) We are evaluating the prototype, not you – there are no wrong answers here.

3) We are interested in what **you** think – not what you think 'people' will think. So don't worry about what anyone else might think, and just focus on what you think.

-:-:-:-:-

Possession Level Prototypes

Blurring

Blurring is when the content of a digital possession is set to be blurred by default, and the user holds their finger or thumb to their phone screen in order to unblur it. The content only remains unblurred as long as the user is touching the screen.

/ Play the video

Questions

- What is your initial reaction to Blurring?
- What benefits can you see to Blurring a digital possession like this?
- What drawbacks are there to using it?
- What do you think of the name of this interaction?
- If you could change one thing about Blurring, what would it be?
    - Is there anything else you would change?

Cropping
Cropping is when content is removed from a digital possession by the user. The content can be returned to the digital possession after it has been removed if desired.

/ Play the video

Questions

- What is your initial reaction to Cropping?
- What benefits can you see to Cropping a digital possession like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Cropping, what would it be?
    - Is there anything else you would change?

Condensing
Condensing is when specific parts of a digital possession are collapsed into a small space by default. The user would have to hold a finger or thumb to their phone screen in order to expand the digital possession to its original state. The content only remains condensed as long as the user is touching the screen.

/ Play the video

Questions

- What is your initial reaction to Condensing?
- What benefits can you see to Condensing a digital possession like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Condensing, what would it be?
    - Is there anything else you would change?

Additional Question

- What do you prefer: being able to change specific parts of digital possessions (like in condensing part of the text thread), or changing the entire digital possession (like in blurring)?

Replacing
Replacing is when parts of a digital possession are replaced with something else. The content can be returned to the digital possession after it has been removed if desired.

/ Play the video

Questions

- What is your initial reaction to Replacing?
- What benefits can you see to Replacing a digital possession like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Replacing, what would it be?
    - Is there anything else you would change?

Additional Question

- If your digital possession was publicly visible (for example, on Facebook), would you want the changes you make via Replacing to be visible to anyone that can view that possession, or just to you?
    - Why?

Add Custom Tags
Adding custom tags to a digital possession is when a user is able to create a new category of information and attach it to their digital possession; they can use that additional information to sort their collection of digital possessions.

/ Play the video

Questions

- What is your initial reaction to Adding a Custom Tag?
- What benefits can you see to Adding a Custom Tag a digital possession like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Adding a Custom Tag, what would it be?
    - Is there anything else you would change?

Hiding Information
Hiding information on a digital possession is when a user makes certain data connected to a digital possession invisible, to reduce the amount of information they see when accessing that digital possession.

/ Play the video

Questions

- What is your initial reaction to Hiding Information?
- What benefits can you see to Hiding Information a digital possession like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Hiding Information, what would it be?
    - Is there anything else you would change?

Collection Level Prototypes

Setting a Time Range
Setting a Time Range is when a user sets a specific time range in which they do not want to be able to access digital possessions; for example, setting a time range during around the dates they were in a relationship, and not being able to see any photographs that were taken between those dates.

/ Play the video

Questions

- What is your initial reaction to Setting a Time Range?
- What benefits can you see to Setting a Time Range like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Setting a Time Range, what would it be?
    - Is there anything else you would change?

Importing Ex's Possessions
Importing ex's possessions is when a user copies digital possessions that were shared with them or in which they were tagged from their ex-partner's collections into their own collection. Those digital possessions will belong to that user, and cannot be affected by their ex-partner.

/ Play the video

Questions

- What is your initial reaction to Importing an Ex's Possessions?
- What benefits can you see to Importing an Ex's Possessions like this?
- What drawbacks are there to using this?
- What do you think of the name of this interaction?
- If you could change one thing about Importing an Ex's Possessions, what would it be?
    - Is there anything else you would change?

CLOSING (5-10 mins)

Of all the different prototypes we looked at today, which do you think are the most useful?

- And why?

Are there any features that you would have expected to see today, but didn't?

- What are they?

DEBRIEF

Thank you for taking part in the session today – being able to gather feedback like this is really helpful for me, and I really appreciate you taking the time to be a part of my work!

- Ask if they have any questions for me
- Give them the Amazon voucher!