Design for Rituals of Letting Go: An Embodiment Perspective on Disposal Practices Informed by Grief Therapy

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People increasingly live their lives online, accruing large collections of digital possessions, which symbolically represent important relationships, events, and activities. Most HCI research on bereavement focuses on *retaining* these significant digital possessions to honor the departed. However recent work suggests that significant digital possessions may complicate moving on; they function as both comforting and painful reminders but currently provide inflexible methods for disposal. Little work has investigated the disposal of digital objects as a means of *letting go*. To better understand this we interviewed 10 psychotherapists who employ rituals of letting go to help patients overcome loss in situations such as a divorce, a breakup, or a stillbirth. Patients disposed of either natural artefacts or symbolic personal possessions through actions such as burning, burying, or placing in a body of water. Therapists noted people increasingly have digital possessions, and that the act of deletion does not offer the same cathartic sense of release as disposal of material artefacts. Based on analysis of this grief therapy, we propose a new conceptual framework for rituals of letting go that highlights temporality, visibility, and force. It provides a vocabulary to talk about disposal. We then offer design implications connecting the rituals of letting go to the disposal of digital things. Based on our interviews and analytic framework, we propose novel technologies that better connect the embodied nature of letting go rituals to the process of digital disposal.

Categories and Subject Descriptors: H.1.2 [Models and Principles]: User/Machine Systems; H.5.3 [Information Interfaces and Presentation]; H.5.m. [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

General Terms: Design, Experimentation, Human Factors

Additional Key Words and Phrases: Artefact disposal; rituals of letting go; embodiment; grief

1. INTRODUCTION

People increasingly live their lives online, accruing large collections of digital possessions [Sas and Whittaker, 2013; Odom et al., 2010; Whittaker, 2011]. Many of these digital possessions symbolically represent important relationships, events, and activities. HCI research has begun to examine these digital possessions in the context of bereavement and separation. However much of this work explores retention and celebration, specifically how such possessions can serve as positive reminders of a relationship and to honor the departed [Odom et al., 2014; Petrelli et al., 2008; Petrelli and Whittaker, 2010; Kirk and Sellen, 2010].

In contrast, other work suggests the issues around digital possessions are more complex. Specifically it draws attention to problems arising from the retention of digital possessions [Odom et al., 2010; Sas and Whittaker, 2013]. It identifies the need for *disposal* of symbolic digital possessions to move through the separation process [McAlexander, 1991; Odom et al., 2010; Sas and Whittaker, 2013]. During life transitions, people often want to separate themselves from painful reminders, but the disorganized nature of people's digital collections makes it difficult to identify specific symbolic possessions to retain or to discard. This lack of organization also means that people accidentally encounter painful reminders at unexpected times. People who actively try to dispose of digital materials relating to their recent romantic breakup are confronted with the inflexibility of deletion. Deletion is a crude binary process leading to negative side effects [Sas and Whittaker, 2013]. On the one hand, those who immediately delete digital materials may later regret this decision, e.g. when they later want to revisit positive aspects of the relationship. On the other, those who 'keep everything' encounter frequent unwanted reminders in unexpected contexts promoting distress and anxiety.

These problems with digital disposal indicate we need a better understanding of how people dispose of emotionally charged possessions in ways that reduce long-term negative emotional consequences. This paper examines 'letting go' which we define as the process of working through the negative feelings associated with loss through death or separation. Letting go is critical during life transitions related to the loss of loved ones through breakup, divorce or bereavement, when one's identity and attitudes to significant possessions are acutely called into question [Bowlby, 1980; Kübler-Ross, 1997]. Personal grief rituals are one way for people to separate themselves from a former relationship by disposing of a symbolic artefact such as scattering ashes at a significant location, giving away physical possessions associated with the lost loved one, or tearing up an ex partner's photo. However we know little about the practicality of informal grief rituals and the experience of disposal of symbolic objects, be they physical or digital, man-made artefacts or natural objects.

To better support letting go and shift digital disposal practices beyond mere deletion, we need to better understand key properties of rituals of letting go. This paper explores informal, personalized rituals of letting go conducted within therapeutic practice for the benefit of the bereaved people. Such rituals are enacted through physical transformation of symbolic objects representing the relationship with the loved one. We explore these physical disposal practices to identify opportunities that apply to people's digital collections. We interviewed 10 psychotherapists with extensive experience in grief rituals and 'letting go', asking them the following questions:

- What is the *nature* of rituals of letting go and their basic function? Do they sever the relationship [Freud, 1917] or transform it and its related grief [Massimi and Baecker, 2010; Odom et al., 2010b; Sas and Whittaker, 2013]?
- What *types of objects* are used in rituals of letting go and what are their material properties? Are they predominantly physical artefacts [Massimi and Baecker, 2011], digital artefacts [Sas and Whittaker, 2013; Uriu and Okude, 2010] or a mixture [Odom et al., 2010b]? Do people engage in crafting new symbolic objects to be disposed of?
- What *types of disposal practices* do people engage in during rituals of letting go? Are they predominantly passive [Odom et al., 2010a, 2010b] or active involving increased body movement? Do people dispose of entire collections [Sas and Whittaker, 2013] or significant objects within those collections [Odom et al., 2010a, 2010b]?
- What is the *spatio-temporal and social organization* of rituals of letting go? Do they take place in domestic places or outdoors? Which are the critical temporal aspects? Are these rituals predominantly solitary or group experiences?

We apply these insights to digital possessions which we define as *privately owned* collections of photos, videos, and audio files, documents, emails, instant messages, text messages and phone numbers. These are directly accessible by people and entirely under their control to select and delete [Sas and Whittaker, 2013]. While Social Networking Sites (SNS) material such as contacts, photos, tags, posts, updates can also be highly symbolic [Sas et al 2009a, 2009b; Viet et al., 2016], however, they are also problematic to dispose of as they allow for limited ownership, access, and control [Sas and Whittaker, 2013; Davies et al, 2015], and are therefore beyond the focus of this paper.

Based on an analysis of informal disposal rituals we generate a conceptual framework for the experience of letting go; a complex symbolic practice involving manipulation of objects, that includes personal possessions as well as naturally occurring or either hand crafted things. We detail three types of disposal practices: covert, open, and dynamic; characterized across dimensions of embodiment or the role of one's body in disposal, the visibility of the result of bodily actions on objects, and the speed of objects' transformation.

The framework also addresses issues of temporality, sacredness and spatial organization of rituals. We use the framework to critique current digital disposal as lacking many critical aspects of letting go, and explore how letting go might be better addressed through new designs. Our design implications include new release-centric interactions, digital craft for disposal, organically dying artefacts, and augmenting physical artefacts with digital affordances to better support disposal.

2. RELATED WORK

This paper addresses two distinct areas of research: HCI research on digital possessions and behavioral research on letting go as a way of overcoming grief. We provide an overview of each area and then detail work that addresses the intersection of the two.

2.1. HCI Research on Digital and Material Possessions

We first review HCI work comparing the meaning of digital and material things. Digital artefacts tend to be *immaterial* [Odom and Pierce, 2009, Petrelli et al., 2008, Petrelli and Whittaker, 2010], *pervasive* [Sas and Whittaker, 2013] and *permanent* [Kirk and Sellen, 2010]. Aspects such formlessness, spacelessness, placelessness, and timelessness simultaneously increase the functional value of digital things while complicating their long-term symbolic value [Odom et al., 2014]. Their immateriality makes digital possessions less valuable [Odom and Pierce, 2009; Petrelli et al., 2008, Petrelli and Whittaker, 2010]. Yet, people resist deleting them, particularly when their content does no harm. People rarely need to get rid of their old digital things to make space for the new. This results in cluttered, fragmented, heterogeneous, and overwhelming large collections, which makes even the thought of curating them painful. However, when their evocative content becomes problematic [Kirk and Sellen, 2010; Odom et al., 2011b], people are forced to undertake this difficult task to curate their digital collections [Sas and Whittaker, 2013]. Aside from the difficulty of selecting the artefacts to dispose of, the process is also problematic. Deletion emphasizes the binary states of digital artefacts [Odom et al., 2010a], offering little to support ritualistic letting go [Odom et al., 2010b, Sas and Whittaker, 2013]. Immateriality prevents physical actions on digital things. Deletion does not support the fragility and slow transformation that physical artefacts may undergo during ritualistic disposal [Odom et al., 2010a, 2010b]. Digital and physical possessions have very different properties, which need to be carefully considered in the context of ritualistic disposal. This paper adds to the existing literature by exploring how material properties affect rituals of letting go, and suggesting how these properties might be incorporated into digital contexts.

2.2. Rituals of Letting Go in Grief Therapy

There is no specific theory that directly addresses *letting go* and its relationship to overcoming grief. However, the idea of letting go has traditionally been contrasted with attachment, for instance in developmental theories of infant separation and individuation. Three major theories of loss and grief point to a letting go process as: (i) releasing relationship attachments as described in Freud's model of bereavement [1917], (ii) emotional detachment as in the acceptance stage of Kübler-Ross' model [1997], and (iii) acceptance of the reality of loss as in Bowlby's attachment theory [1980].

Loss and grief are universal human experiences. These experiences are socially shaped by norms, values and traditions as shown by a large literature on cross cultural aspects of bereavement [Goss, 1999; Eisenbruch, 1984]. For example, van Gennep [2011] showed that rituals of transition following death are complex and culturally rich and may share

common themes such as regeneration and growth. Thus, personal rituals of letting go demand sensitivity not only with respect to the individual but also to culturally shared norms and cross-cultural emerging themes [Romanoff, 1998]. Rituals of letting go do not play a role in all cases of grief. Sometimes people prefer to hold on [Romanoff, 1998]. Letting go is relevant to the traditional grief strategy of cutting ties with the deceased [Freud, 1917]. Letting go is also critical when maintaining the bond increases difficulties of adapting to loss [Rando, 1985]. In such cases, rather than accepting the death and the transformation of the relationship into an internalized one [Bowlby, 1980; Field, 2006], the bereaved experiences a blurring of the boundaries between the living and the dead, with the physical presence of the deceased continuing to be sought years after the loss has occurred [Field, 2006; Gupta and Bonanno, 2011; Klass, 1996]. Other maladaptive forms of continuing bonds involve writing or talking to the deceased long after their death, wearing or carrying a symbolic reminder of the deceased, using possessions for embodying the deceased in order to maintain the illusion of physical contact [Running et al., 2008], or stalking a former romantic partner online [Sas and Whittaker, 2013].

A long-standing tradition in grief therapy [Castle and Phillips, 2003; Hart, 1983; Rando, 1985; Running et al., 2008; Hoven et al., 2008] has shown that *personal rituals* are an effective means of overcoming grief [Gupta and Bonanno, 2011; Running et al., 2008]. Their benefits include "a sense of peace when grief is met with acceptance and understanding" [Running et al., 1985]. The ritualistic use of symbolic objects and actions can change attitudes to both the bereaved and the relationship, leading to a transformed self and an enduring internalized representation of the lost loved one [Castle and Phillips, 2003; Running et al., 2008]. In this paper we further add to the literature on rituals of letting go with a focus on disposal actions and their symbolic objects.

2.2.1. Disposal of Symbolic Objects in Rituals of Letting Go

Rituals of remembrance and continuing bonds tend to be structured around attachment to the deceased and the symbolic objects representing them [Castle and Phillips, 2003; Running et al., 2008]. Such rituals include lighting a candle or putting flowers by a photograph [Running et al., 2008], creating an altar, or publishing the departed's love poems [Castle and Phillips, 2003]. Most work on grief rituals has emphasized *holding on* to symbolic relationships, for example through treasured mementos or *linking objects* [Volkan, 1972]. In contrast, less work has explored *disposal* of objects in rituals of letting go. Examples include burning letters and gifts from an ex-partner [Sas and Whittaker, 2013], or slow decomposition of a late wife's sculpted work [Odom et al., 2010b]. In the realm of digital possessions, prior work has described the ritualistic deletion of digital collections [Sas and Whittaker, 2013], including deletion of emails [Odom et al., 2010a], photos and Facebook material [Odom et al., 2012].

The value of disposal practices has been discussed in material culture research, pointing to disposal as a means of severing important relationships no longer relevant for the current self [Lastovicka and Fernandez, 2005]. Since any major loss can be ritualized to support adjustment, psycho-therapeutic rituals extend beyond bereavement to also address loss arising from separation. Rituals marking relationship breakup, separation and divorce also employ symbolism, manipulation, and disposal of objects [McAlexander, 1991]. The cultural denial of divorce and the emphasis on preserving the continuity of family life for children mean that such rituals are seldom performed for the emotional separation of the married couple. This paper extends what we know about rituals of letting go, with specific physical and digital objects and their ritualistic manipulation.

2.2.2. Embodied Ritual Practice and Phenomenology of Letting Go

In rituals, bodily qualities and physical actions are particularly relevant in bringing emotion, thought and intention together so that a feeling of stepping out of the mundane and ordinary is experienced more deeply [Kavanagh 1990; Parkin 1992, Rando 1985, Turner 1967,]. The act of actively *doing something* can mitigate passive victimization following loss [Hoven et al., 2008]. In a critique of anthropological studies of the body, Jackson [1983] has explored the role of rhythm and movement in ritual performance suggesting that rich involvement of sensory modes can heighten ritual experience. He explored ritual activities as an *embodied* rather than verbal praxis, arguing that ritually-induced patterns of body use may lead to new experiences and insights. His argument, as well as ours, draws on embodied therapies and somatic mind [Mehling et al., 2011; Loke and Robertson, 2013] as well as Merleau-Ponty's embodied cognition [1962] emphasizing the instrumental role of the bodily experiences in making sense of the world.

Another useful theoretical lens to explore human actions in embodied cognition is image schemata [Lakoff and Turner, 1989]. Image schemata are representations of specific and repetitive embodied experience of bodily movement through space and manipulation of objects that people develop tacitly from infancy [Lakoff and Johnson 1999]. They are therefore embodied, abstracted across a vast range of perceptual experiences, multimodal involving holistic sensory experience, and universal. They also play a critical role in reasoning and language use [Gibbs, 2006]. We explore embodiment and action in the context of rituals of letting go, while addressing the gap in the understanding of design for disposal and emotional processing.

2.3. HCI Research on Rituals, Grief and Digital Disposal

HCI researchers have explored a range of family rituals, from celebration to grief, to better understand the appropriate role of technology. Bringing technology into family traditions, such as Christmas rituals, can be disruptive and experienced as inauthentic. Researchers note opportunities for designs that better integrate technology, such as systems that focus on increasing feelings of togetherness that align with this celebration [Petrelli et al., 2012]. Similarly, in exploring family identity in dining routines and rituals, Hupfeld and Rodden [2012] found that while domestic spaces for food consumption resist technological augmentation, there are unexplored opportunities for designing for celebratory-mundane, solitary-social dining experiences.

Zimmerman [2009] identified family rituals as a rich space for embedding technologies to support meaning making. Zimmerman's work notes that integrating technology within the meaningful rituals people regularly enact, such as reading to children at bedtime or religious practice, offers a rich opportunity to increase the meaning people perceive in the digital artefacts they use. There has also been interest in the design of technology for religious rituals, such as mobile phone applications supporting prayer practices through the use of symbolic imagery of Islamic faith, [Wyche et al., 2009]; technologies to record and document religious rituals through photos as a private memento of pilgrimages, or audio recording of religious confirmation [Foucault and Melican, 2007]. Other findings point to tensions induced by technology in the embodied practice of reflection and praying [Wyche et al., 2006]. The importance of religious rituals as resources for design has also been explored, with findings pointing to the value of symbolism, respect and sacredness [Foucault and Melican, 2007].

In recent years, there has been increased HCI interest in the role of technology for bereavement and grief. A particular emphasis has been on issues arising from dealing with the digital records of the deceased [Massimi and Baecker, 2010; Odom et al., 2010a, 2011].

Passing on uncurated collections of digital things is overwhelming, and people struggle with what constitutes acceptable practice. The challenge of sifting through vast disorganized collections, whose meanings are often elusive, means that neither lovingly retaining nor deleting all items feels appropriate. This has given rise to a new interest in technologies for *informal grief rituals* [Massimi and Baecker, 2011; Odom et al., 2010a], also reflecting a Western social trend towards ritual secularization and individuation [Odom et al., 2011a; Hoven et al., 2012]. Some work has investigated new forms for technology to support bereavement, mostly focusing on design that celebrates and reinforces the connection to the departed. These designs provide support for personal rituals of *positive remembrance* in the home through physical artefacts such as digital photo albums [Odom et al., 2011a], rituals of *praying* for the deceased in front of a digital altar whose candle light controls photo slides [Uriu and Okude, 2010], rituals of *implicit communication* between the grievers through mourning stones which heat up when remotely touched [Hoven et al., 2012], rituals of *explicit communication* between the bereaved and the dead through social media [Brubaker and Hayes, 2011; Getty et al., 2011], and rituals for *re-enacting* the departed while wearing a SenseCam to support later reflection [Lindley et al., 2010].

We know little about how the bereaved benefit from such technologies in remembrance rituals. Massimi and colleagues [2011] discussed the dilemma of such systems in providing both evocative, comforting cues as well as painful reminders - which Odom et al. identified as *visceral markers* of one's loss [2010b]. While most HCI work has focused on *retaining* objects as a way of continuing the bond, less work has explored the value of *letting go* of personal possessions or disposal, for dealing with grief and moving on [Hoven et al., 2012]. Examples from material culture include analysis of mothers' disposal of children's possessions as a way to a new stage of life [Phillips and Sego, 2011], or disposal of material assets following divorce [McAlexander, 1991]. Within HCI, there has been limited exploration of digital disposal in rituals of letting go. One exception is the work of Sas and Whittaker [2013] focusing on disposal practices following the dissolution of romantic relationship. They identified rituals of letting go consisting of deleting vast digital collections of symbolic material representative of the relationship and performed after careful consideration. Another example is the work of Odom and colleagues [2010a, 2010b] who explored the disposal of key possessions in rituals of letting go, as a means of putting to rest core aspects of relationship with the departed. They noted the slow decomposition of inherited material possessions as a desirable property, as well as the specific practice of sporadic deletion of digital symbolic possessions. They also identify the limitations of the binary state of digital artefacts in bereavement, suggesting more nuanced digital disposal inspired by gradual decay of material objects and growth of patina [Odom et al., 2010b].

A related concept, previously addressed in this space is *forgetting,* which Sas and Whittaker [2013] defined as a process for limiting the impact of outdated emotional and self relevant experiences discordant with the current self. Letting go also aims to limit the impact of emotionally charged memories [Sas et al., 2013, 2015]. A key distinction is the mechanism through which each operates. While intentional forgetting involves blocking, repression, suppression, or inhibition of material to be forgotten [Joslyn and Oakes, 2005], letting go involves *emotional processing* often associated with the grief work through which the bereaved has successfully absorbed emotional disturbances and can remember the event without experiencing distress or disruption [Rachman, 1980]. This distinction leads to novel implications for design, which for forgetting emphasise automatic harvesting and self-control for limiting access, whereas for letting go the focus is on craft for moving on and emotional sense-making,

Most prior HCI work on grief has focused on death. Other forms of loss such as that experienced by chronically ill patients in the *end of life care* [Sas et al., 2016], or those

following premarital and marital *breakup* can be equally problematic [Bowlby, 1980], particularly in the digital realm [Gershon, 2011]. While less explored in the HCI field [Odom et al., 2011a; Sas and Whittaker, 2013; Yarosh and Abowd, 2009], divorce has become increasingly common and much less socially supported than the strongly ritualized celebration of marriage. Examples of technologies supporting post-divorce family life include mobile phones and digital calendars for coordination of busy daily logistics [Odom et al., 2011a], but these do not address emotional and symbolic aspects of breakup, which is our focus here. Other recent work has explored the problems around disposal of digital possessions following pre-marital breakup, showing that these possessions evoke negative reminiscing leading people to employ different strategies in dealing with them [Sas and Whittaker, 2013].

By avoiding the extremes of total deletion or total retention of their digital possessions, a few people adaptively engage in selective disposal, performed ritualistically to enable the process of letting go. Sas and Whittaker's work [2013] emphasized the value of ownership in disposal practices, and the challenges of disposing of digital artefacts that are out of one's control, such as photos of oneself posted on others' Facebook pages. This work moves away from *retention* of possessions and continuing bonds, to *disposal and letting go* of some aspects of the relationship and the grief. It also observes that people engage in rituals of letting go involving digital disposal and that deletion is often an impoverished choice for such ritualistic disposal. Learning about the qualities of rituals of letting go involving physical artefacts can support the understanding of their qualities and how they may apply to digital ritualistic disposal. What is needed in this respect is a deeper understanding of the concept of letting go and of griever's benefits from rituals of letting go.

3. METHODOLOGY

This paper investigates therapeutic rituals of letting go to inform the design of technology that better supports the emotional needs of users engaged in grief work. Their motivation for grief work is what matters, whether people suffer from complicated grief or not. By exploring the properties of ritual objects and disposal practices enacted on them, we inform the design of new technologies for digital disposal that go beyond simple deletion. To understand people's current disposal practices, we interviewed experts in such disposal rituals, grief therapists who had worked with many patients in overcoming grief and who regularly employ rituals of letting go in their practices. Given the sensitivity to the concerns of ritual protagonists who are grieving, we interviewed therapists as their proxies. Therapists approach grief therapy with the perspective of a concerned outsider, allowing them to observe effective practices across a number of cases. Their professional ability to observe, introspect, and reflect, allows them to articulate the complex nuances entailed in the practice of letting go as a means of dealing with grief. They are also able to provide insights into the design rationale of rituals of letting go, and value of artefacts and bodily actions. Finally, their extensive experience allows them to generalize across people and cases. We encouraged participants to share their experiences as psychotherapists and ritual facilitators. Two of the therapists we interviewed, P7 and P8, were ritual protagonists themselves, offering insightful first person accounts of their own rituals of letting go. These personal rituals were performed as part of their continuing professional development years after the loss of the loved ones. In this paper we focus on personal rituals, for which we agree with Schnell's [2009] definition of rituals as formalized patterns of actions for constructing meaning from a personally relevant event. We interviewed 10 psychotherapists with expertise ranging from 4 to 40 years. The sample's average expertise in both therapy practice and grief rituals is greater than 20

years. Eight participants incorporate elements of Drama therapy through symbolic play and ritual theater, and they incorporate elements of Creative Arts through sand play therapy. All practitioners have postgraduate qualifications in disciplines such as Psychotherapy, Psychology, Drama and Arts therapy, including 4 PhD, 4 MSc and 2 Postgraduate Diplomas. Six participants work in the UK and four in the US, with eight of them being females and two males (mean age 54, range 33-69). The sample was carefully selected. Each psychotherapist had extensive practical expertise built on strong academic training: all ten have postgraduate training, and seven have over 15 years of psychotherapy practice. In addition, they are registered and accredited with various professional bodies regulating the psychotherapy profession in both the UK and USA. This means that study participants have achieved a set, substantial level of training and experience, and abide by standards of conduct, performance and ethics in their practice. UK-based participants are accredited by the British Association for Counselling and Psychotherapy (P10), the UK Council for Psychotherapy (P4, P5), and the Health and Care Professions Council including membership with the Sesame Institute of Drama and Movement Therapy (P6, P7, P8). The USA-based participants are accredited by the American Psychological Association (P1,P2) and its divisions, i.e. APA Marriage and Family Therapy (P3) and APA Transpersonal Psychology (P9). Our sample is biased towards Western culture settings, predominantly the UK and US, and is important to acknowledge that the study findings reflect this bias.

The sampling procedure consisted of two non-random techniques. The first was purposive, where we identified 30 expert psychotherapists through advertisements in online bereavement networks, therapist mailing lists, and on-line search using keywords such as grief, rituals, psychotherapy, body and objects. This was followed by a snowball technique with 4 participants being referred by the initially invited ones. Each study participant was rewarded with a gift voucher worth £30.

We conducted semi-structured interviews to explore personal grief rituals and in particular the role of the body, actions, and symbolic objects. Within this paper we describe a subset of the findings focusing exclusively on participants' understanding and practice of personal rituals of letting go. We explored how psychotherapists co-create such rituals for dealing with the loss of a loved one through death or separation, to allow their clients to let go of certain aspects of their life and embrace new ones. We asked participants to recall in detail examples of their most successful rituals of letting go: "*Could you give me a description of the best rituals of letting go that you helped people use or create; their aim, place and time?*" We also inquired about the benefits of those rituals: "*How do you know that the ritual was successful?*" We asked about types and roles of symbolic objects in these rituals: "*What objects do people use and how are they selected? What are their properties and meanings?*" Specific attention was paid to the phenomenology of ritual experience and bodily actions employed for the disposal of these objects: "*How do people enact rituals of letting go, what actions do they perform and what is their meaning?*" Not least, we discussed digital disposal, its value, challenges and limitations when compared to physical disposal.

Our study participants align with the tradition of using rituals in grief therapy [Castle and Phillips, 2003; Hart, 1983; Hart and Ebbers, 1981; Rando, 1985; Running et al., 2008; Hoven et al., 2008]. Their suggestions for the use of rituals are based on expertise and in-depth understanding of their clients and attunement to client needs. People tend to engage in therapy between 6 months and 2 years after their loss (although in rare cases this can extend to decades), because they experience psychological pain and an inability to move on in their grief process. The interviews lasted between 60 and 90 minutes. They were audio recorded and fully transcribed. 747 quotes capturing rituals were coded and analyzed using Atlas/ti. The data analysis involved standard techniques of coding and thematic analysis. A

conceptual framework developed from prior literature provided initial categories of personal possessions as types of symbolic objects [Odom, et al., 2011; Petrelli et al, 2008], and slow degradation as a form of disposal practice [Odom et al., 2010a, 2010b]. This framework was refined using the interview data and new codes emerged to capture additional symbolic objects both organic and inorganic, as well as a more diverse set of disposal actions. The identified themes were discussed extensively through weekly meetings to reach consensus within the research team.

4. FINDINGS

We start with a brief overview of the value of letting go rituals, and summarize their ritualistic objects and actions. We critique digital disposal, and then follow with a discussion of the spatio- temporal and social ecology of rituals of letting go.

4.1. Beyond Honoring: The Importance of Letting Go

Our findings extend prior HCI descriptions of grief following *bereavement* to include other types of grief experienced by our psychotherapists' clients. Besides rituals assisting in bereavement through death of one's partner (P1,P2,P10,P7), spouse (P1,P9,P3), parent (P8), sibling (P4), or an unborn child through stillbirth (P2,P5,P6), our participants characterized new types of grief including termination of a relationship with a living person through separation and divorce (P1-P4,P7-P10). Participants provided accounts of their experience of facilitating and observing rituals, or of performing them, i.e., P7 and P8. Most of the quotes capture 2nd person perception of observed rituals, but in the few cases when they refer to study participants' 1st person experience, we make that explicit in the text, i.e., (P7, 1st person experience).

The identified rituals were performed as "*a way to letting go of the grief, because that is still very real*" (P1) and "*to move on from some of that grief and integrate that into one's experience*" (P6). In the case of loss through separation, rituals of letting go are performed when the relationship is no longer perceived as beneficial but the emotional bond is too strong to allow ex-partners to move on: "*you are so broken-hearted or have so much anger and resentment that you cannot move on*" (P1). Identifying what someone really needs to let go of is an important part of such rituals: "*it is not just the person, it's the dreams, the intention, the hurt, the resentment*" (P1). Most participants described rituals of letting go as *intentional activities* marked by readiness and commitment to let go (P1,P3,P4,P9), with the aim of producing "*a movement or transformation of some type*" (P8), "*a human experience that touches us deeply and can move us along from one place to another*" (P6). Enabling such *emotional shifts* while dealing with grief (P1,P3-P5,P7-P10) was identified as crucial. Although the interviewed psychotherapists have different backgrounds and represent a variety of therapeutic orientations, most agreed that such emotional shifts are significant indicators of therapeutic success, leading to increased wellbeing: "*a healthy merging, a sense of belonging, a sense of being in the presence of something greater than the here and now*" (P5) so that people "*feel that they can move on with their life*" (P10). Success means that clients have fewer ruminative thoughts and sinking feelings (P3,P7) and even decide to terminate the therapy "*I still get a message from him every Christmas that says: I'm doing really well, thank you very much*" (P4).

The interviewed therapists shared views on what promotes successful rituals while being humble and not prescribing attitudes towards their clients. They show sensitivity to clients' feelings and respect their creative input in the design of the rituals. Therapists' comments suggest that rituals of letting go are highly embodied practices, enacted to deal with charged memories. Whether due to death or separation, one aim of the rituals is to

help people *transform* the grief experience so it becomes less embodied, *"making less visceral the related strong sensory memories"* (P9). Letting go did not mean forgetting the lost loved one, but *"de-romanticizing the events, not to cheapen them[but] not to feel them as intensely as you did originally"* (P9). These rituals of letting go helped to process strong, enduring negative feelings. While positive feelings may also be associated with letting go, we found little positivity in our data. Indeed, the therapists provided rich accounts of participants' perceived emotions during these rituals: *"You're letting them really feel. […] is going to be really painful"* (P1); and *"people may cry when they are putting down a particular object"* (P6). The *doing* involved in such rituals is not separated from *feelings*, but functions as a means to transform those feelings. Previous work described the interdependency between intuitive and instrumental forms of grief, as related to feeling or doing, respectively [Martin and Doka, 1999]. While we acknowledge both doing and feeling, we will describe the doing side in more detail. This is because the *doing aspect of grief* has received considerably less attention, and it is more problematic for digital possessions because their lack of materiality, makes the doing more difficult.

When performing rituals of letting go, a shift happens in the protagonists' emotional landscape and, as a result, their relationship with the lost loved one. As an internal experience, the shift cannot be directly observed, but enabling and experiencing it is crucial for the success of grief therapy. One potent way of enabling the shift is through embodied metaphors of letting go, which promote a less visceral experience of the relationship with the lost loved one compared with the experience of relationship prior to loss. In this respect, our findings support previous work on the transformation of a relationship and its grief [Massimi and Baecker, 2010; Odom et al., 2010b; Sas and Whittaker, 2013], but we focus on a different mechanism that drives this transformation.

4.2. Object Types: Not Always Possessions

The therapists noted their patients employed *diverse types* of artefacts in rituals of letting go. These differed in types and properties from those described in prior work. In particular, therapists spoke of pre-owned, man-made possessions with properties that are different from those previously documented in honoring rituals [Massimi and Backer, 2010, 2011; Odom et al., 2011a]. In addition, they also spoke of objects made of natural materials, imbued with symbolic meaning.

4.2.1. Personal Possessions, Not Photos

The therapists described ritualistic disposal of grievers' personal possessions such as love letters (P7), gifted jewelry (P10), photos (P7), wedding rings (P1,P2,P3), and household items, *"something that they bought together from their house that was special to them and every time they look at it, they think of that person"* (P1). This matches findings on ritual disposal of material artefacts to overcome divorce [McAlexander, 1991], and ritual disposal of personal *digital* possessions after relationship dissolution [Sas and Whittaker, 2013].

Photos featured highly among home possessions and are often used for honoring the deceased [Massimi and Baecker, 2011; Uriu and Okude, 2010]. Interestingly, photos seemed to have only a limited value in rituals of letting go. Several participants pointed out that photos of a lost loved one were not appropriate for ritualistic disposal. Photos are highly representational of a person at a specific time and place [Petrelli et al., 2008]. Letting go rituals, however, demand artefacts that represent the totality of a relationship (P1,P8,P9): *"pictures are really an easy thing to do, but, they aren't it […] because pictures typically are representative and not imbued [with one's energy]"* (P1). Rituals of letting go are not about disposing of the lost loved one, but instead work to dispose of one's grief.

For these reasons grief letters or more symbolic objects seemed to work better. Only one participant incorporated photos into rituals, and only after the photo's content had been actively transformed: "*I cut [a picture] in a way so that I created something different; you cannot recognize what it was*" (P7, 1st person experience).

An important question concerns the properties of particular personal possessions that lead them to be selected for rituals of letting go. Which possessions get chosen from larger collections memorializing relationships? Chosen objects symbolically represent the relationship by capturing "*its essence and memories*" (P6). They need to be "*chosen by people out of their own metaphoric world*" (P3). The symbolic value is inferred rather than explicitly represented. In addition, a symbolic possession must be highly valued and not casually discarded: "*a true giveaway, it has intention and power so they can feel a tug in their heart about parting with it [...] the object that they're giving is not just something that's torn up*" (P1), but respectfully handled and offered: "*it wasn't like she wanted to throw this thing [medallion] away at all. It was much more about offering it back to nature in order to be able to let go*" (P10).

Previous work notes that the most common, symbolic, personal, physical possessions tend to be large objects filling the space of the home, i.e. furniture, bed, visual arts, sculptures, collections, TV, stereo, radio or books [Csikszentmihalyi, 1981]. A mixture of large and smaller symbolic objects was also found in HCI studies of physical mementos [Massimi and Baecker, 2011; Odom et al., 2011a; Petrelli et al., 2008]. In contrast, therapists recommended small, wearable objects for disposal: "*small that can be kept with the person, carried in a pocket*" (P3) and "*[can be] held in one hand*" (P2). All the ritual objects they spoke of were small and handheld.

The therapists did not pre-identify symbolic objects among their patients' possessions. "*I pretty much leave it to them and I don't give them ideas [...] but a lot of times people struggle finding an object*" (P1). Therapists sometimes helped patients overcome this challenge by suggesting they choose something other than a personal possession. In contrast to prior work [Odom et al., 2010a, 2010b], we found that rituals of letting go often involve the *creation of new objects* or the selection of *naturally occurring symbols* expressed by inorganic and organic materials. The importance of selecting naturally occurring objects or crafting of new ritual objects from natural materials is indicated by the fact that they were mentioned as frequently as pre-existing man-made possessions.

4.2.2. Unique Grief Objects: Selected or Crafted Natural Material Objects That Can Be Transformed in Natural Ways

Our findings reveal the significance of inorganic objects that are seldom mentioned in accounts of symbolic personal possessions [Csikszentmihalyi, 1981; Petrelli et al., 2008]. Examples include stones (P9), crystals (P2, P6, P9) or objects made of clay (P1). With a few exceptions [Hoven et al., 2008], limited HCI work has explored the value of such materials in design for the bereaved. These natural objects could symbolize the relationship, but unlike personal possessions, they have to be more actively chosen for ritual purposes. This occurred in two ways. The first involves finding a suitable natural object and imbuing it with symbolic meaning: "*we worked with a crystal to represent her unborn child, and imbued with love, sorrow and apology so that it really got evocative*" (P2). The second involved crafting a new object from natural material, which gets imbued with symbolic meaning through the making actions: "*a clay vessel [honoring the relationship] embodying what was really good [...], the journey they took together and the sacred memories*" (P1). This extends findings indicating the importance of actively doing something to reclaim agency after loss [Hoven et al., 2008], and previous design suggestions for grief technologies such as *craft for moving on* [Sas and Whittaker, 2013] and *making things* [Massimi and

Baecker, 2011]. Rather than holding on to the crafted object to honor the relationship [Massimi and Baecker, 2011; Odom et al., 2010b], the therapists spoke of ritualistic disposal.

Ritualistic disposal extends to grief objects made of organic material, such as paper-based letters (P1,P2,P3,P4,P7) written by the ritual participants both to express and work through their feelings towards the lost loved one. While previous work has shown the value of journal writing to process grief [Massimi and Baecker, 2011; Pennebaker and Chung, 2011], or letters in communicating with the lost loved one [Odom et al., 2011a] their *disposal* has been less explored. Such letters become potent objects to be ritualistically disposed of (P1,P2,P3,P4,P7): *"People write a letter to the person, never sending it but writing everything they want to say. And then in their back yard or in the woods, build a little fire, read the letter in front of the fire and then burn it"* (P3).

Flowers have been long viewed as symbols of love and respect in bereavement, and they were used in ritualistic disposal (P3,P8), often alongside other organic objects such as human ashes (P3,P4). *"I left the flowers, so I kind of let that all go"* (P8). Therapists also spoke of other organic, symbolic objects, i.e. seeds and seedlings (P1,P2,P3). Previous work revealed the symbolic role of plants for expressing personal values of nurture and connection with the natural world [Csikszentmihalyi, 1981]. In contrast, in rituals of letting go, plants and seeds become imbued with symbolic values of renewal and growth, reflecting the importance of transforming the relationship and grief experience: *"they planted a rose bush over it [buried ashes of grief letters]. That is more about putting something to rest in the earth and then planting with new hope for a happy future, some kind of growing thing"* (P3). Just as people are asked to reflect on what they are letting go of, these rituals also invite thinking about important future aspects of one's life that can be infused with new energy: *"what the seeds are is a new beginning, what is next, what are you cultivating in your life"* (P1). This reveals a critical distinction between personal possessions that express the essence of the *past* relationship, compared to organic objects that afford *future-oriented* transformation adding power to the disposal act: *"without ending something properly, the [new] beginning never has a strong foundation"* (P1).

At both symbolic and physical levels, these natural objects share the same properties as man-made personal possessions. They represent the relationship, while tending to be small and handheld. An important characteristic of natural objects is their appropriateness for disposal through exposure to natural elements. Dissolving in water or decomposing in the ground is part of the natural process of change initiated by people, yet outside their control. We conjecture that these kinds of transformation are more intuitive for natural objects than for synthetic ones, and, as shown in the next section, often preferred.

To conclude, while most work has emphasized the value of *existing possessions* in bereavement [Odom et al., 2011a], our work extends this in several directions. First is the issue of ownership with our findings showing the importance of the griever's *own symbolic artefacts* rather than bequeathed or inherited possessions [Massimi and Baecker, 2011; Odom et al., 2010b]. We show the *limited value of photos,* contrasting with their benefits in honoring rituals [Massimi and Baecker, 2010; Uriu and Okude, 2010]. Our findings also indicate the prevalence of physical artefacts in rituals of letting go, extending the previous focus from man-made possessions [Massimi and Baecker, 2011], to *naturally occurring* objects. Whether found or newly crafted, such objects are imbued with relationship symbolism for the purpose of ritualistic disposal.

4.3. Ritual Enactment: The Symbolism of Disposal Strategies and Actions

Disposal practices varied along three aspects. The first is *force,* exercised on the objects to be disposed of. Our findings indicate two such forces: for moving the object away from the ritual protagonists and for fragmenting it. There are also two types of agents exercising these forces: the human body and natural elements. The latter highlights participants' emphasis on ancient elements such as water, earth, fire and air. As disposal media, each of these elements brings unique qualities to the ritual experience and the phenomenology of letting go.

We define *force* as a characteristic of disposal action which captures the exercising of agency through: (a) type of *force*, i.e. move and fragment; and (b) its agent, i.e. human body and natural elements. If the disposal involves predominantly human action we call it *active* disposal, if it involves natural elements, we call it *passive* disposal. Water, air and earth allow for passive disposal through drift, decomposition, dissolution and renewal, while human force is needed for transformation, destruction and deconstruction. The second aspect is *visibility,* defined as the ability of a disposal action to be viewed until its completion. With respect to visibility, disposal actions can be visible as in the case of release, drift, cut, tear, throw, transform; or take place out of sight as in the case of dissolve, decompose, renew. A third aspect is *temporality,* which describes the *duration taken to dispose of the object,* i.e. seconds for actions such as cut, tear, throw, transform; minutes for release and drift, and months or years for dissolve, decompose, renew. Disposal can be immediate or delayed, taking any duration from minutes to years.

These aspects of disposal allowing us to identify three disposal strategies: open, covert, and dynamic, which we now explore both at the physical level, i.e. the symbolic objects disposed of and their manipulation, as well as the symbolic level, i.e. qualities of the embodied metaphors of letting go. Such metaphors highlight not just the embodied memory, akin to handling grandmother's ladle for engendering reminiscence about her [Kirk and Sellen, 2010], but more importantly, for the non-verbal emotional processing of grief-related memories. As we further discuss, an understanding of the properties of physical objects, and the qualities of their disposal practices offers insights into how digital disposal may be better addressed. Our data and the emerging themes sketch a foundation for a more motivated and rigorous approach to *letting go* in HCI research.

4.3.1. Open Disposal Strategy: Passive, Quick and Visible through Release and Drift

Passive, quick, visible actions are the most common form of disposal, being mentioned by six participants (P3,P4,P5,P7,P9,P10). At the physical level, they involve releasing ritual objects in moving water or air so that they drift away from the ritual protagonist. Objects disposed of in water include personal possessions such as jewelry gifts from the lost loved one: "*I worked with a woman who brought a medallion and she wanted to let it go in a river that was flowing east to west […] she said all the things she wanted to say to this person out loud in nature, and when she was ready, she said, "And now, I'm ready to let go" and she put the medallion in the water […] it was done with respect and care and love*" (P10). Other personal possessions are fragments of love letters and lost loved one's photos that were flushed away and then subjected to a highly symbolic act: "*I threw them [the pieces of the picture and letter, in the toilet] and then I also did something else, which it came into my mind at that moment […] there is water in the toilet, but I have water as well in me […] it was exactly this process of letting go of everything*" (P7, 1st person experience). Additional things disposed of through release and drift were grief messages addressed to the lost loved one in the form of "*written things on balloons or tied things and let them go*" (P4). Sometimes, only the balloons are released to float away, such as in: "*the ritual [for a small baby] of letting*

off balloons. It was the tiny little coffin that was taken to the grave and balloons being released" (P5).

As well as such personal possessions, we again saw examples of symbolic objects consisting of natural materials. These included inorganic stones imbued with relationship symbolism: "*[During union rituals] I take a piece of ribbon and loosely bind their hands together, often with a stone in both of their hands [During a separation ritual] I will unbind their hands, that they can cast the stone into flowing water*" (P9). Organic objects such as human ashes and flowers were also disposed of in water: "*scattered ashes at sea […] floating on the surface of the water, […] and each person says their own goodbye and tosses a long stem flower down on the water*" (P3).

At a symbolic level, disposal through release and drift appears centred on the embodied metaphor of *releasing* and *letting go* of associated negative emotions of grief, as "*the movement [of the object] quite often is symbolic*" (P6). The qualities of this form of disposal relate to the flowing water or upward movement of lighter than air gases, carrying the object away from the ritual protagonist. Release in both water and air is fast and visible so it can be witnessed until the ritual's completion: "*we stood for a while silently watching the river [take away the immersed medallion] and then she reported to me that she felt some change in her own energy […]. that she could move on in her life.*" (P10). Release also involves limited embodiment, as it merely requires placing the object into the water, or letting go of the balloon's string. This surrenders the object to the tide, river, or gravity defying helium filled balloon, to carry it away.

4.3.2. Covert Disposal Strategy: Passive, Slow and Hidden through Dissolution, Decomposition and Renewal

Passive, slow, hidden disposal involving water and earth media was mentioned by four participants (P1,P2,P4,P9). This involves placing in a large body of water symbolic objects made of inorganic material such as: "*a clay vessel [honoring the relationship] and then they are dissolving it in the ocean or the river*" (P1). After water, earth was the next most common medium for disposal of objects through burying them for decomposition i.e. digging a hole, placing the object in the ground, covering it up, as well as for renewal purposes, e.g. by planting seeds. The most common personal possessions to be ritualistically buried included wedding rings: "*she went to this special beach that she loves and she took her wedding ring and she buried it deep in the sand*" (P1), and letters capturing the griever's feelings (P1, P3, P4, P5, P6): "*people dig a hole and place the writings that they have done*" (P1), or used to enact a symbolic funeral: "*he went to the site where his father's ashes had been scattered and conducted his own funeral service […] he read a eulogy with his family standing by the grave, he then folded it and pushed it into the earth*" (P4). Other organic things disposed of in the earth are seeds and seedlings planted at the burial place of the symbolic objects: "*putting [the plant] into the earth, not as a letting go, but with the intention that it will grow*" (P2).

At the symbolic level, implicit to this form of disposal is the slow and gradual decomposition that the buried objects undergo, or dissolution that objects released in the water submit to: "*what water is able to do to stone is over eons of time*" (P1). Unlike disposal through release and drift, this long process is invisible, occurring without the ritual protagonists witnessing it. The embodied metaphors of disposal through dissolution and decomposition allow both symbolic objects associated grief emotions to fragment: "*inevitably there is going to be a connection between the external experience and the inner one*" (P8). This is akin to slow decay and sedimentation previously suggested [Odom et al., 2010a, 2010b]. The earth allows disposal through renewal, through the metaphor of planting the seed of hope for new beginnings: "*give it back to the earth as everything comes*

from the earth […] there is a promise of life and healing that gets added to the seeds […] is about transformation and birth-life-death cycle" (P1). Dissolution involves quick and visible drift, while decomposition follows the visceral act of burial: "*there is something really powerful about digging in the earth*" (P1), and "*covering it [the hole] up*" (P2). The actual decomposition, dissolution and renewal occur outside one's control, making this form of disposal a less embodied, or physically passive process.

4.3.3. Dynamic Disposal Strategy: Active, Quick and Visible through Transformation, Destruction and Deconstruction

Four therapists spoke of dynamic disposal (P3,P4,P7,P8). On a physical level, this involved throwing symbolic objects in a fire and watching them get *destroyed* and *transformed* into something new. It also involved acting an object with one's hands to *deconstruct* it, i.e. cut or torn apart. After water, fire was the second most mentioned element in rituals of letting go, and the symbolic objects selected to be burned include grief letters: "*they write about their experience*" (P2), so that "*whatever it is that is bothering them is written down in detail and that is burned*" (P9).

Disposal through fire involved melting symbolic marriage artefacts such as wedding rings and re-crafting them into new objects: "*a lot of times people have taken their wedding rings and have them melted and made into a new object […] They went to a craftsperson who could create something*" (P3). Once transformed and disinvested of their original meaning, such objects continue to be part of the bereaved's life as "*a little gold tiny sculpture to wear around their neck […] they just enjoy it as a piece of jewelry*" (P3). Similar findings on emotional disinvestment of symbolic personal possessions have been identified following relationship breakup [Sas and Whittaker, 2013].

Deconstruction involved cutting and tearing symbolic objects. For example, one participant mentioned cutting textile-based material such as ribbons to enact the metaphor of letting go and moving on: "*I used ribbon or string to show that there has been disconnection and sometimes you can ritually cut the string*" (P3). Other participants referred to cutting or tearing paper-based material such as letters, written to express feelings of grief: "*tearing the letter in pieces and scattering it on water*" (P3), or of love letters and photos of the ex-partner: "*I cut it and I made up a few words that came out and then I had a picture which again, I cut it in such a way that you cannot recognize what it is*" (P7, 1st person experience).

Often the resulting fragments were disposed of using ancient elements such as fire and water, acting on ex partners' love letters and photos: "*a letter that was just not honest […] I burned the rest [fragments of cut letter and photo] and with the pieces of the picture that I kept, I travelled somewhere to a public area and I threw them in the water*" (P7, 1st person experience). This in turn promoted emotional disinvestment from the remaining photos: "*his photos are still among my other stuff, but now they hold the same position as pictures of my childhood; they do not hold the same emotional stress*" (P7, 1st person experience). As a result of this symbolic transformation, both the remaining possessions and the newly transformed artefacts became emotionally disinvested.

At a symbolic level, disposal through fire evokes the embodied metaphor of *transforming* and *destroying* both the symbolic objects and their associated emotions of grief: "*with burning, we know it is destroyed or it goes into a newer realm*" (P4), or "*there is also a destructive aspect [as] a contained fire allows the containment of that destructive energy*" (P8). This transformative quality was the hallmark of disposal through fire, which is both fast and visible. Fire is "*exciting […] draws you in; you cannot not look at a fire*" (P8), so that people feel compelled to witness the ritual until its completion: "*I was crouched watching a lot […] wanted to light the fire, let it run its course and then go back*

inside" (P8). This form of disposal was highly embodied as reflected in the physical act of building the fire: "*she described building the fire and lighting the fire and when the fire was blazing hot, the throwing of these two pieces of paper into the fire*" (P4). The act of throwing was one of the most active rituals, signaling the embodied metaphor of discarding a no longer wanted aspect of self: "*she did a very strong bodily gesture of throwing something away [such] intuitive and unplanned gesture can be used to inform a ritual action for example [throwing written text in the fire]"* (P4). The embodied action of cutting or tearing objects mirrors the metaphorical cutting of a connection "*deconstructing the former relationship*" (P8). Active disposal appears to have the unique quality of rejecting the symbolic meaning imbued in the object, such as cutting up dishonest love letters from an ex-partner (P7) to be burned in *"the fire which for me was more connecting with fiery intention […] feelings of anger or hate or hurt"* (P7, 1st person experience).

To conclude, ritualistic disposal is a complex practice construed around actions performed on specific symbolic objects summarised in Table 1. In addition, the identified disposal actions can be mapped against disposal activities such as release for "place in moving water" or "into the air", decompose for "bury", renew for "sow", transform for "melt", deconstruct for "cut" or "tear", and destroy for "burn".

Object Type	Symbolic objects	Disposal strategies	Disposal actions	Loss due to
Preexisting possession owned by the griever	medallion (P10), necklace (P2)	Open	place in moving water	Separation
	small household items (P1)	Covert	bury in the ground	Separation/divorce
	wedding rings (P1, P2, P3)		bury in the ground	Divorce
			melt in fire	
	photos of & love letters from ex (P7)	Dynamic	cut; burn	Separation
Natural-material based symbolic objects: inorganic and organic	crystals (P2)	Open	place in moving water	Unborn child
	stones (P9)		place in moving water	Divorce
	clay vessel (P1)		place in moving water	Separation/divorce
	letters/things tied to balloons (P4, P5)		into the air	Death, separation/divorce
	bereaved's grief letters (P1, P3, P4, P5, P6, P9)		place in moving water	Separation/divorce
		Covert	bury	
		Dynamic	burn; tear	
	seeds and seedlings (P1, P2, P3)	Covert	sow in the ground	Death, separation/divorce
	textile-based ribbons (P3)	Dynamic	cut	Divorce

Table 1: Disposal objects, actions and their experiential qualities

Moreover, it is not only the objects that are symbolic but their disposal also becomes imbued with symbolic meaning, as letting go of objects implies letting go of the negative emotional content lying at the core of grief. While all interviewees mentioned symbolic objects used during the rituals of letting go, half of them also identified griever's letters (as these are purposefully created for the ritual enactment, we do not consider them as pre-exiting possessions). This highlights the value of language-based processing of the negative grief emotions, which complements the nonverbal, tacit or embodied processing consisting of manipulation of objects. It is worth mentioning protagonists' ability to design complex

rituals and, for those who narrated their own rituals of letting go, the preference for more than one natural element to be used throughout. For example, P7 enacted a sequence of rituals in dealing with the same grief problem, by enacting disposal through fire and water as various grief feelings got expressed and processed. There also appears to be a link between discrete emotions and different forms of disposal: feelings of sadness and regret tend to be associated with passive disposal practices (drift, decay), whereas anger tends to be channeled through more active ones (burning, cutting).

The identified strategies reflect a tendency for coupling active with quick disposal, as well as quick with visible disposal. The key aspects of force, temporality and visibility are however important orthogonal dimensions which can be reflected upon to support novel disposal strategies for coupling for example slow and visible disposal.

4.4. Digital Disposal Lacks Critical Aspects of Letting Go

Although *digital* disposal was not central to their current practices, the therapists had strong views about it. Their comments focused both on the lack of a physical form and the problematic action of deleting. *"[Digital disposal] is a fascinating concept. I heard people say things like they could only recognize the relationship was over when they could delete the person's phone number from their mobile phone. I had also suggested very strongly to someone that they delete a text"* (P4). Participants also showed strong interest in rituals of letting go for digital disposal: *"I would ask them to move [relationship-related digital material] to a thumb drive so that is now holding the embodiment of the relationship. Then leave it for at least twenty-four hours to contemplate really seriously before they act out of their passion. [To dispose of it and to let go involves] giving it back to the earth"* (P1). This quote exemplifies several of our participants' answers about the value of selecting and storing digital artefacts within a single container, allowing it to be ritualistically and physically disposed of. It also suggests the importance of considered reflection about one's readiness for ritual, confirming previous findings about the importance of avoiding impulsive deletion [Sas and Whittaker, 2013].

Participants noted several limitations with the act of digital deletion when compared with physical disposal. These relate to the dimensions of disposal practices previously discussed: force, temporality and visibility. An important shortcoming is deletion's limited embodiment when compared to physical disposal: *"to delete does not seem very powerful; [it is important to use the gesture] of opening the hand and releasing the object"* (P3). It is also deceptively final, appearing accessible and facile, while deemphasizing the importance of intention: *"young people often think that by pushing delete, it is gone. But is not; it is still carried inside one's heart"* (P1). Although a human action, deletion does not capture force in the same way that physical disposal does. Deletion allows for neither the movement nor the fragmentation of digital artefacts, failing to capture any of the embodied metaphors of letting go. The issue of temporality also emerged as important. Interviewees mentioned that pressing the delete button was felt to be too immediate for ritualistic use and that slowing down the disposal practice is an important quality currently lacking in digital disposal: *"people need something that slows the process down"* (P4). Instantaneous deletion differs from the quickest forms of physical disposal which takes seconds or minutes. It also means reduced visibility of the disposal process. For example slow disposal may be hidden but objects still undergo fragmentation which can be imagined. Digital disposal lacks this quality. By being discrete rather than continuous, deletion does not support the visibility of relationship transforming: *"delete is a very depressing sort of status: one deletes one's relationships. [Instead] that could be held in a sort of transformative container"* (P8). These observations point to the need for a more nuanced understanding of

critical aspects of effective rituals of letting go. They also advance the critique of binary representations of digital possessions [Odom et al., 2010], towards more embodied, slower, and visible digital disposal practices [Sas and Whittaker, 2013]. It is important to note that these findings do not argue that physical disposal is the only way to let go. As we will show later, digital affordances could enrich rituals of letting go, in ways that the physical world cannot. We can still learn about the efficient forms of physical disposal in grief, and how their qualities might be exploited to better support digital disposal.

4.5. Spatio-Temporal Sacredness and Social Organization of Rituals of Letting Go

Another important characteristic of rituals of letting go is their sacred quality. "[*Rituals] help us stop our normal day-to-day activities and allow our minds and hearts to be open to wonder and awe, a sense of sacred for something larger than ourselves, […] a deeper valuing and awareness of time and place and activity*" (P3). This quote captures the sacred perspective of rituals as reflected in most of participants' interviews. Two specific dimensions of sacredness emerging from the findings are temporal and spatial ones, which are further detailed.

4.5.1. Temporality and Sacredness

The relationship between the temporal and sacred aspects of ritual experience is probably less surprising, as our outcomes confirm the temporal category of sacred time enacted through the respectful manipulation of symbolic artefacts [Foucault and Melican, 2007]. As mentioned by P3 "*we use ritual to move from Chronos time, like one minute after another, into a different kind of time that's called Kairos*". While Chronos time is sequential and quantitative, Kairos marks a qualitative moment of indeterminate time when something special happens. As one steps out of physical time into a sacred ritual time, the perception of time also alters: "*I don't think that there is such a thing as standard time*" (P8).

With respect to temporality, additional outcomes relate to ritual time of enactment, ending, and duration. Rituals were temporally framed events, consisting of a distinct beginning, middle and end. Particularly important is identifying significant dates for enacting the ritual. For example, participants suggested relationship anniversaries as potent milestones: "*It was around his birthday as well or my birthday. It was when I turned thirty-eight. My father died when he was thirty-eight […] and that ritual was on the anniversary of his death so it was very significant that I was the same age as him and was now going to be in my thirty-ninth year, something that he didn't reach […] I was an older man than he ever got to*" (P8). If the beginning of the ritual has to be clearly marked, the ending can be less so, in which case people remained at the ritual place for some indeterminate period: "*he stood for a while silently watching the river*" (P10), or: "*he was crouched watching [the fire] a long while*" (P8). Burning seemed to provide a stronger sense of closure: "*the fire was important for me as it framed the ritual time. I didn't think about it in that way, but, yeah, I wanted to light the fire, let it run its course and then go back inside*" (P8). Participant P8 noted the importance of containing the rituals within a *predetermined spatio-temporal setting: "ritual comes out of sacred time and space, and there has to be containment around that".*

Whether it lasts ten or sixty minutes (P4, P8, P10), ritual time was usually perceived as passing too quickly "*I'm often surprised at how quickly rituals tend to move*" (P4), so there is an explicit effort to slow down time. This was achieved through pacing the disposal actions: "*I burned [the letters] one after the other*" (P7, 1st person experience). Another way of prolonging the ritual's time was through continual watching of the artefacts' movement as P3 described: "*I invited each person to silently come up with a long*

stem flower, say their own goodbye and toss the flower down below on the ashes floating on the surface of the water ". The third way of altering time in ritual was delaying the entire disposal process: "*I went through the pictures and through the letters; I chose which I wanted [to dispose of] and I kept it with me for one more day*" (P7, 1st person experience). Imposing a delay confirms demonstrations of the value of careful reflection before disposal [Sas and Whittaker, 2013]. Previous HCI work has mostly explored the temporal aspects of user experience (Lim et al., 2007), including slow design interaction principles [Hallnäs and Redström, 2001, Odom et al., 2014], or interactive narratives [Benford and Giannachi, 2008], with less focus on how temporality is controlled by the user [Lundgren, 2013]. Our findings suggest novel ways of controlling temporality in ritual experience.

4.5.2.   Spatiality and Sacredness: Wilderness and Natural Elements

Therapists spoke of the sacredness of place. They describe some rituals as "*coming into a place, a set apart sacred space*" (P5). Like temporality aspects, place tended to be personally relevant*: "meaningful which have power for [protagonists] personally*" (P1). Most participants emphasised this sacred quality of the ritual surrounding and location, which just like temporality, requires a step away from the mundane: "*it was a ritual for me .... I created a space internally and externally for this action to happen*" (P7, 1st person experience).

But what kind of sacred places are relevant for rituals of letting go? While most of the work on physical and digital possessions has focused on the home as the primary space for curating collections of cherished possessions [Kirk and Sellen, 2010; Petrelli et al., 2008], and enacting separation rituals on digital possessions [Sas and Whittaker, 2013], our findings extend them to larger outdoor spaces. Such spaces often include nature-based places (P1, P4, P8, P10) "*wilderness places: the forest or the ocean or the desert*" (P1). These exhibited several properties relevant for letting go rituals. First, in addition to the personal meaning of the ritual location, there was a deep sense of respect for this specific location: "W*hen they walk out into their natural place, people are watching and listening for a place that calls to them. If they're in the forest, it might be a particular tree that really radiates or stands out, might be a bush that's waiting*" (P1). Second, such spaces facilitated *direct access to the natural elements*, i.e. water, earth, air, and fire. Such elements were essential in enabling natural disposal processes aligned with the cycle of living, dying and renewal. Even when performed indoors, such natural elements were harnessed albeit at a reduced scale, i.e. toilet water, candles or fireplaces. Third, many places exuded the restorative power of nature "*a beautiful place transforms your whole consciousness*" (P1). The only disposal action that did not involve the elements, i.e. deconstruction, took place exclusively indoors, generally in the private space of one's bedroom. Outdoor locations were still preferred for the remaining disposal practices. Fourth, beside the restorative value of nature, and access to the natural elements, environmental spaces elicited emotional memories and their expression: "*the sound [of the ocean] can be so embracing and supportive of crying, of tears*" (P2). Another important quality is the privacy these spaces offer: "*it might be helpful if the person has total privacy like at a beach scene to read the letter out loud before they tear it up*" (P3). While the remoteness of these places protects the ritual protagonists from being observed and interrupted by strangers, they did not exclude the participation of trusted others in the ritual process.

There has been limited exploration of wilderness places in HCI. A notable exception is Bidwell and Browning [2010] who explored their unique qualities and relevance, highlighting the relationship between the embodied and affective experience of a place

and technological functionalities. The authors identified several relevant themes such as bodies remembering natural places, story-spaces and meaning making, nature's rhythm and cycles, as well as spirituality. Our findings confirm most of these themes: people need to connect first with the outdoor place before performing the ritual, to experience its restorative power and ability to elicit emotional memories, to engage in bodily performance and meaning making, and attune to nature cycles of birth, grow and decay. One significant additional aspect that our findings suggest is the importance of spatial sacredness and ancient natural elements in rituals of letting go that can be directly accessed in wilderness spaces, i.e. water, earth, air, and fire.

To conclude, our findings suggest that sacredness of rituals of letting go revolves around embodied practice in a sacred spatio-temporal frame outside the mundane and ordinary. We now reflect on the *tension between seriousness and playfulness*, as prompted by a participant: *"I think rituals have to do with transformation, which has a certain irony and playfulness about it. And such transformation also involves seriousness. When rituals involve natural elements such as the earth or fire, I think they lend themselves more to seriousness"* (P8). The polarity between solemn/serious and ludic, or the sacred and the profane has been addressed by Turner [1979] in his work on ritual, Huizinga's seminal work on play [1955] also emphasized the value of play as a theatrical performance in the ritual act. He argues for the fluidity between seriousness and play, and that in rituals just like in play, protagonists are transported to a different world away from the mundane. Like play, rituals also take place in a specific spatiotemporal frame, engender suspension of disbelief, flow, absorption and rapture, and are constrained by a set of rules. We agree with Huizinga's performative aspect of ritual, but also with the contrasting position that seriousness is a distinct quality emerging from play. Unlike play which focuses mostly on performance for entertainment purposes, rituals are transformative and authentic. While they may involve staged performance to transport people to a different emotional space, rituals have the added potential of transforming both the present and future of their protagonists [Torevell, 2004]. The argument for seriousness extending beyond the playful, performative aspect of ritual has been also made by Okagbue [1997]. He claims that unlike in play, in rituals, actions and objects are more symbolic than metaphoric, rituals tend to recapture a time rather than create fictional realities, and are means to an end rather than an end in itself. Such emphasis on sacredness and seriousness is relatively novel in HCI and could open up new design opportunities.

4.5.3. Sharing with Trusted Others

The rituals of letting go tended to unfold over three phases: preparation, enactment, and reintegration. In addition to ritual protagonists, three categories of social roles emerged from participants' answers: the role of ritual facilitator played by the psychotherapists, the role of ritual co-participants, and witnesses played by protagonists' supportive social network. Each of these roles is briefly detailed.

The therapist's assistance with designing the ritual was emphasized in several accounts: *"we will do a lot of work and planning and then the person will go away and do the ritual and then come back and report what happened"* (P4), although it is *"very important that every ritual we did came from them"* (P5). While some rituals were performed in solitude, there were also accounts of divorce rituals where the soon not-to-be couple enacted the ritual synchronously: *"in a separation ritual both people do it at exactly the same time… and they're both doing exactly the same thing, but in different places. And when they're done, they call each other and leave a message that they have completed it"*

(P1). This is an interesting outcome, suggesting the value of rituals protagonists' remote awareness of each other's ritual completion.

For bereavement, participants also referred to co-located group participation in funeral rituals for the disposal of human ashes (P3), or for symbolic burial (P4). During enactment, social support consists of providing validation, as "*rituals are probably powerful when they well up from the group of individuals concerned*" (P8), witnessing, as "*having a witness can also be incredibly sacred*" (P1), legitimization, as "*their community will step forward and encircle them and help them make that transition to the next stage*" (P3) and accountability: "*having companions [helps] to hold you accountable*" (P3). After ritual completion, social support is provided to facilitate recall so that "*if the person needs support in the future remembering this day and this ritual, then [the witnesses] are there for that person*" (P3), and sense-making, as "*the person doing the ritual might get so lodged in their emotional state [and] the witness can help make meaning out of it and help bridge them back to their life*" (P2). These quotes emphasize the emotional charge within rituals of letting go and the value of capturing its significant aspects for future recall and sense-making. Protagonists' perception and recollection of a ritual's space and time is altered, and the integration of ritual experience can strongly benefit from some capture and social sense-making.

Our exploration of ritual experience adds new perspectives to the increasing interest in time in HCI and in particular sacred time [Foucault and Melican, 2007]. Designing for rituals of letting go can benefit from the provision of temporal markers, support for sacredness and for users' control over the speed and pace of their disposal actions. Spatial organization of rituals of letting go intersects figural object spaces with environmental, wilderness spaces facilitating access to natural elements. Such spaces have additional restorative and emotion elicitation values. Therapeutic rituals of letting go are facilitated and usually witnessed by the psychotherapist. Additional social support is also encouraged both during, and more importantly after the ritual's completion.

4.5.4. Mementos that Mark or Capture Rituals and Support Sense-Making

Mementos aim to *capture* the experience of rituals of letting go. To clarify, although in one sense remembering is a form of holding on, what is being remembered here is the experience of letting go and not the initial problematic relationship or experience. Thus, mementos do not capture negative feelings of grief, but instead they represent closure. Capturing or marking rituals is supported by a variety of artefacts including disinvested ritual objects that previously symbolized the relationship, e.g. melted wedding rings transformed into a necklace (P3). Additional artefacts marking the ritual completion included stones placed around the ashes of the fire-based ritual: "*it was a circle of stones…putting the stones around allowed something psychically to be marked*" (P8, 1st person experience). The same participant also mentioned the lack of objects symbolising the completion of ritual, and their value in legitimising the end of the relationship as it used to be.

Apart from objects marking the successful completion of rituals, other mementos included photos capturing key moments of the ritual experience. For example, the outcomes of sand play therapy were captured through photos of sandbox configurations, over several months: "*each thing is photographed for about six months so that afterwards we can look through all the photographs together, I will give them the photographs on a CD or memory stick so they can go away and print them out […] people look at them from time to time, or when it has a deep significance they will print, frame it and put it on the wall*" (P6). This aligns with previous research on memory technologies that point to the

value of mementos in capturing significant events [Petrelli et al., 2008], and with photos and audio recording being used to document religious rituals [Foucault and Melican, 2007]. Our findings extend previous work, suggesting value in videos or collections of still pictures, ensuring that key elements of the ritual process are captured: "[*the filmed ritual of balloons released in the air] moved the parents because it reminded them of their baby flying away. It was beautiful and powerful and they could return to it."* (P5). Our findings also highlight the value of automatically capturing ritual experience as the process unfolds over time. This is in line with previous findings on people's interest in capturing how collections of home artwork evolve [Kirk and Sellen, 2010].

To conclude, the spatial ecology of rituals of letting go integrates figural object space within environmental spaces. Such integration is particularly powerful in enabling private access to natural elements for disposal of highly symbolic handheld personal objects, while benefiting from restorative power of nature and its ability to elicit strong emotional memories. In terms of the social ecology, ritual protagonists are active co-designers of their rituals, while benefiting from support from their trusted friends both for ritual enactment, as well as after its completion for follow up sense-making and integration. The latter activities might be supported by creating visual ritual mementos, which can be shared.

5. DISCUSSION

5.1. Towards an Embodied Conceptualization of Letting Go: Beyond Retention and Deletion

We now revisit the initial research questions and further discuss the theoretical significance of our findings. We use the findings to inform a new conceptual understanding of disposal that situates it within prior HCI work, but also motivates new design opportunities that address some of the problems we observed. Given the sensitivity to the concerns of ritual protagonists who are grieving, we interviewed therapists as their proxies. We acknowledge that there may be differences between the accounts of the two groups and our findings largely present the accounts of therapists rather than the ritual protagonists themselves. People engaged in grief therapy and rituals of letting go may also be a specific population. The outlined findings reflect the Western cultural setting of our study participants, and as grief is culturally specific, we make no claim regarding their relevance beyond this context, nor do we explore cross cultural aspects of grief.

A key contribution of our work is a deeper understanding of the embodied practice of letting go. Our major theoretical implication relates to reframing the HCI bereavement literature to move beyond the extremes of retention and deletion. Our work reveals additional practices of letting go, which differ from the preservation and cherishing perspective previously described. In particular, we extend the focus of HCI work on bereavement from the curation of collections of inherited artefacts for honoring the departed through retaining, upkeeping and treasuring them, often via pictorial representations [Massimi and Baecker, 2010, 2011; Odom et al., 2011a]. We add to that work by noting the importance of *disposal, both of unique, newly created grief objects, as well as non-pictorial artefacts selected from among the bereaved's pre-existing personal possessions*. We also characterize a rich set of disposal actions that extend beyond binary deletion.

Like Massimi and Baecker [2011], we found that with rituals of letting go, people prefer material rather than digital objects. Material artefacts can be hand crafted and the use of natural materials allows for elegant decay using earth and water or transformation with fire. Our participants hinted at the growing importance of digital artefacts in rituals of letting go. This is important, as digital artefacts have become increasingly challenging following the

loss of the loved one [Brubaker et al., 2011; Getty et al., 2011; Massimi and Baeker, 2011; Odom et al., 2010a, 2010b, Sas and Whittaker, 2013], and people are starting to ritualistically dispose of digital collections [Odom et al., 2010a, Sas and Whittaker, 2013]. Digital disposal through deletion is problematic. Our findings not only confirm the limitations of current binary digital states [Odom et al., 2010a, 2010b] but also extend them by pointing to the limitations of deletion from an embodiment perspective. In years to come, digital disposal will demand increasing attention particularly for younger technology savvy generations, expert in digital curation. How can we redesign digital disposal beyond deletion, in the light of the critical properties of ritualistic physical disposal that we identified here? Our findings show that in psychotherapy, ritualistic artefact disposal is a highly embodied practice involving objects and their physical manipulation. In dealing with grief, should things be deleted, physically acted on or passively laid to rest [Odom et al., 2010a, 2010b], particularly in the context of the problematic ownership of digital artefacts on social media? Should people dispose of entire collections or merely significant objects [Odom et al., 2010a, 2010b, Sas and Whittaker, 2013]? Our findings on the different types of disposal practices offer an initial framework to start exploring such questions. Thus, an important outcome is deeper understanding of letting go and how it contrasts with attachment, as well as the tension between passive decomposition and active release or transformation when disposing of symbolic objects.

While holding on is biased towards stasis and integrity of cherished objects, ritualistic letting go tends towards motion, transformation and fragmentation of symbolic objects. Our findings confirm the tension between holding on and letting go, or between attachment and individualization [Bowlby, 1980; Freud, 1917; Kübler-Ross, 1997; Fourtounas, 2003]. If object retention supports continuing emotional bonds by honoring the memory of the lost loved ones, disposal is useful for processing grief, particularly grief emerging from problematic forms of maintaining those bonds. Active curation of personal possessions has been shown to *reflect* the shifting nature of the relationship with the departed [Massimi and Baecker, 2011; Odom et al., 2010a, 2010b; Sas and Whittaker, 2013]. In contrast, our findings suggest that ritualistic disposal does more than that: it *enables* the transformation of the relationship itself. These disposal practices highlight two forces enabling objects' movement in space and integrity over time. We explore the tension between holding on and letting go, to deepen our understanding of each of them (Fig 1).
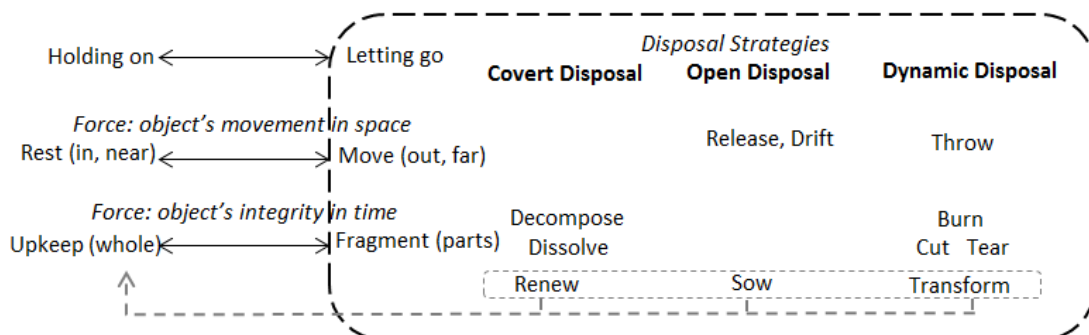

Fig 1 Force dynamics applied to "holding on" versus "letting go", along with observed disposal strategies: Covert (passive, slow, hidden), Open (passive, quick, visible), Dynamic (active, quick, visible)

The large dotted box contains the new critical constructs that characterize letting go, the three main categories of disposal and their associated disposal actions. The actions are grouped alongside the two concepts of force which emerged as important when contrasting

letting go with holding on: the movement of object in space (*out* and *far* rather than *in* and *near*), and objects' integrity over time (*part* rather than *whole*). The double arrows capture the tension between holding on and letting go, and their underlying forces. The last row of disposal actions, i.e. renew, sow and transform, each involve creative change leading to new things, hence closing the loop from fragmentation to whole new objects. From the perspective of such forces, holding on (Fig 2) to an object and its associated symbolism entails (i) keeping it contained and spatially near to the holder's body, and (ii) preserving or protecting its physical fragility from both natural erosion and human volitional destruction. While the importance of curating cherished possessions has been previously noted [Odom et al., 2010a, 2010b; Kirk and Sellen, 2010], the role of force dynamics has not been systematically explored in conceptualizing holding on. In contrast to holding on, letting go involves (i) moving the object away from the ritual protagonist's body, either passively by *letting it move*, e.g. through release and drift, or actively through *making it move*, e.g. throwing; and (ii) interrupting preservation, so that the object undergoes fragmentation either passively by *letting it decay* or slow erosion due to willful neglect, i.e. decomposition and dissolution; or *making it fragment* including rapid willful destruction, i.e. transforming, burning, cutting and tearing.

Fig 2. Reenactment showing holding on to cherished possessions demonstrating spatial proximity and preservation

Of the three categories of disposal practices highlighted in Figure 1, only passive, slow, hidden disposal through decomposition and dissolution has been previously addressed [Odom et al., 2010a, 2010b]. Renewal is a quick visible practice, involving processes such as release, drift, burn, cut and transform, that has been less explored [Sas and Whittaker, 2013], and therefore may open up new design opportunities for digital disposal technologies which we discuss in the next section.

The disposal practices at the bottom of Fig 1, i.e. renew, sow and transform are particularly interesting. Unlike the remaining disposal practices that result in limited material traces, these three processes create whole new objects such as the new plant whose seeds have been sown together with other buried objects, or the newly crafted necklace made from melted wedding rings. These emotionally disinvested objects now no longer carry the charge of the original possession, and can therefore be kept. The practice of sowing seeds accompanies the disposal practice of burial, and entails a subsequent growth or renewal process. But while burial involves personal possessions that express the relationship as it *was*, organic objects such as seeds promote a *future* oriented perspective on the relationship and how it may be transformed. This is a critical distinction from a past- to a future-perspective of the relationship and its emotional processing, which letting go (rather than holding on) emphasizes. This suggests that letting go can be an iterative process, aligned with the larger natural cycle of birth, living and dying of organic objects; or sustainable decaying of inorganic natural objects.

Table 2 summarizes the physical actions of the ritual protagonists and their associated natural elements. It also depicts evocative reenacted images of symbolic objects being disposed of and reconstructed on the basis of the interviews. The ritual actions relate to discrete emotions of anger or sadness, leading to a desire to transform (anger) vs release (sadness).

To summarize, letting go is a process unfolding in time and we discovered that the greater the perceptual and physical involvement with the symbolic object to be disposed of, the richer, and arguably more transformative the ritual experience [Massimi and Baecker, 2010; Odom et al., 2010b; Sas and Whittaker, 2013]. All participants pointed to the importance of bodily actions that transform objects, which in turn promotes relationship transformation. We also extend Fourtounas' conceptualization of letting go [2003] to *an iterative process of acting upon symbolic objects which are carried away in space and fragmented or broken up over time, which enables a therapeutic shift in the emotional landscape.*

5.2. Qualities of Wilderness and Ancient Natural Elements in Design

In addition to these empirical and theoretical insights, another contribution of this paper is to open up the design space of technologies for letting go beyond *the home and into the wilderness*. In contrast most prior work emphasizes home as the central place for curating physical and digital possessions [Kirk and Sellen, 2010; Petrelli et al., 2008; Sas and Whittaker, 2013]. The relevance of wilderness places in HCI is just starting to be explored [Bidwell and Browning, 2010; Kalnikaité and Whittaker, 2011]. Our findings confirm that most of the identified qualities of these spaces are also relevant when enacting rituals of letting go. Critical qualities of the wilderness include eliciting strong emotional memories and its restorative power, which engenders feelings of connectedness to a place. This also relates to sacredness as both a temporal but also spatial aspect of rituals. The fragility of such spaces with respect to human-nature relationship is also revealed together with the value of sustainable disposal practices for both physical and digital artefacts. Our exploration of rituals of letting go extends this initial framework of the wilderness' qualities with those of sacredness, value of ancient natural elements, and fragility requiring sustainable disposal practices.

Our framework can be exploited to inspire design in several ways, for example by examining the value of technology in supporting social practices in the wilderness. There may be a value in suggesting ritual locations based on preference for previously visited places. There may also be value in tracking the ritual's location to capture it as a memento to share with remote significant others. Beside the common functions of identifying special locations, unobtrusive tracking of movement and capturing of experience, technology may be also designed to support attachment, respect and responsibility for natural spaces. To some extent, such values have been intimated by Bidwell and Browning [2010] through their suggestion that design should recede in the background to reveal a different perspective on nature. Our findings suggest that ritualistic disposal is, at its core, a sacred practice performed with utmost respect for the relationship that has ended, the artefact being manipulated and the physical setting where it takes place. The reintegration of the disposed artefact in the cycle of natural elements is central to such practice, providing insight into design for digital disposal. For example, one could start thinking how organically dying artefacts might look, which will be outlined in the following section.

	Tempo-rality	Visibi-lity	Force		Natural element action	Target emotion
			Hand action			
Dynamic disposal: quick, visible, active	Time interval\n\nSeconds (Brief)	Open (High)	Throw (make move)\n\nTransform (make craft)		Burn – fire\nTransform – fire	Anger
			Cut, Tear (make fragment) (High)		—	Anger
Open disposal: quick, visible, passive	Minutes (Medium)	Open (Medium)	Release (let move)		Drift – water	Sadness, Regret
			Release (let move) (Medium)		Drift – air	
Covert disposal: slow, hidden, passive	Weeks, months, years\n\n(Long)	Covert (Low)	Sow (let move/grow) (Low)		Renew – earth	Hope
			None (let fragment)		Decompose – earth	Sadness
			None (let fragment)		Dissolve – water	Sadness

Table 2: Reenactments of disposal strategies and actions organized according to human and natural elements (reenactment)

This characterization of wilderness properties could further inspire design through technologies, which simulate these qualities. For example, air and water are natural elements which enable disposal through artefact movement, i.e. release and drift. Rather than performing digital disposal in direct interaction with these natural elements, novel

technologies may be designed to allow for the bodily gesture of release, and for the simulated artefact's movement. Thus, one can imagine augmenting digital artefacts with physical affordances to allow for a simulated artefact's movement and fragmentation, as described in the next section.

The two directions described above capture three interesting tensions between (i) natural things and technological artefacts; (ii) seriousness and playfulness; and (iii) sustainability and unsustainability. Disposal in the wilderness focuses on mindful disposal with respect for nature's fragility and its cycles. This in turn deemphasizes technology, which may be seen as intrusive in such spaces and practices. Nevertheless, this challenge can be addressed by novel technologies, which blend better with natural elements and can be sustainably disposed of. Our findings indicate that disposal in home spaces relies on simulating the disposal qualities of the natural elements. It emphasizes technology and supports digital disposal, but unlike the wilderness, home spaces have limited ability to elicit a sense of sacredness. Therefore, they pose an increased demand on designing for seriousness, as opposed to playfulness, which may trivialize the ritual's experience. Our findings extend the design space of technologies for letting go through multiple implications for design. Such implications are now discussed in terms of novel interactions, novel digital content and containers, and the ecology of rituals of letting go.

6. IMPLICATIONS FOR DESIGN

We now turn our attention to the value of the study's theoretical insights for informing the design of grief technologies in particular, and interaction design in a broader sense. At the core of our design implications we place bodily interactions and the body's felt sensorial experiences which echo the focus of the third-wave HCI [Bødker, 2006]. Previous efforts to articulate such *experiential qualities* arising from the unfolding interaction and its dynamic gestalt [Löwgren and Stolterman, 2004] include ambiguity, fluency and aliveness as entailed by biofeedback interfaces [Sanches et al., 2010], increased awareness of the fragility of the mobile devices and of the bodily movement around them [Ferreira and Höök, 2011], or increased somatic awareness and aesthetic appreciation for the rhythm of the body [Höök et al., 2016].

A key element of the bodily felt sensorial experiences associated with the practices of disposal is the experiential quality of letting go of the cherished artefact and its emotional content. A useful lens to unpack such experiential qualities and further develop a vocabulary for disposal is provided by the concept of wabi-sabi, rooted in Japanese philosophy and aesthetics. This concept has been referenced in HCI in relation to organic interfaces [Holman and Vertegaal, 2008], craft and repair practices [Rosner et al., 2015], and recently as a resource to inform more sustainable physical and interaction design through conscious use of impermanent materials and media [Tsaknaki and Fernaeus, 2016].

Wabi-sabi is a multilayered construct with a rich set of meanings around the issue of accepting and even celebrating the impermanence of constantly changing reality, core to classical Japanese philosophy [Parkes, 2011]. Such meanings include: austere understated beauty, uniqueness, natural material and unrefined form, present oriented, rustic patina, appreciation for fragility, degradation and ambiguity, as well as for stillness and solitude [Sartwell, 2006]. Such qualities are captured by the seven aesthetic principles for achieving wabi-sabi all of which to be found in nature: asymmetric/irregular, simple, weathered, natural, norm free, tranquil, and of a subtle profound grace. The latter refers to an expansive, deep feeling of reverence towards nature, having an ineffable quality eluding words.

Similarly to Wilson and Bruyere [2010] and Tsaknaki and Fernaeus [2016], we also argue that wabi-sabi aesthetics are a valuable lens to support and teach the grace of letting go. Thus, we expand the value of this construct for HCI community in three specific directions each of which opens up new design opportunities.

The following three sections introduce three design principles [Sas et al., 2014] intended to open up the design space for novel classes of technologies involving release-centric interactions, digital craft for disposal, and organically dying artefacts. These can be conceived to support the three identified disposal strategies: open, dynamic and covert, respectively. Table 3 maps the three qualities of disposal strategies: visibility, speed and force to the implications for design. The cells highlighted in white are covered by our findings, while those in grey are not, i.e. *nature inspired digital art* is an example of the generative power of our framework in opening up new design opportunities. As further described, we further reflected on our findings from the theoretical perspective of wabi-sabi philosophy and its design principles.

	Visible		Hidden	
	Slow	Quick	Slow	Quick
Active	*Transparent*	*Dynamic* Digital craft for repurposing and fragmentation Wabi-sabi principle: crafted imperfections	*Continual*	*Transient*
Passive	*Organic* Nature-inspired design Wabi-sabi principle: incompleteness	*Open* Release-centric interaction Wabi-sabi principle: non-attachment	*Covert* Organically dying artefacts Wabi-sabi principle: impermanence	

Table 3: Disposal strategies, implications for design and wabi-sabi principles they build on

6.1. Supporting Open Disposal: Release-Centric Interactions

Most current memory technologies emphasise retention of acquired physical or digital content as reminders of relationship with lost loved ones [Odom et al., 2014; Petrelli et al., 2008; Petrelli and Whittaker, 2010; Kirk and Sellen, 2010], with less support available for their disposal [McAlexander, 1991; Odom et al., 2010; Sas and Whittaker, 2013]. Our findings however point to the value of a new class of technologies focusing on release (rather than holding, touching or grasping) as innovative forms of interaction.

Release centric interfaces may make us rethink the functions of traditional digital containers be they photo albums, digital jewelry [Olivier and Wallace, 2009], or memory boxes [Frohlich and Murphy, 2000, Petrelli et al., 2012, Stevens et al., 2013]. Key functions of such repositories include storing and selective access for reminiscing. The latter may involve an element of surprise when the content to be accessed is automatically provided, like in the case of a necklace locket, with digital jewelry

displaying randomly selected photos when a dementia sufferer opens the locket [Wallace et al., 2013]. A similar example is thanato-fenestra, a technology for supporting praying for the dead ritual, which randomly displays photos of the departed loved ones, which disappear when replaced by new photos [Uriu and Okude, 2010]. Such repositories however focus exclusively on retaining content.

Rather than focusing on containers' traditional function of preserving content, we may instead envisage new functionalities around *releasing content*. When opened, containers could materialize/display digital possessions such as text, images or sounds one at a time for the last time before they perceptually drift away (symbolically representing the deletion taking place) never to be found or seen again. Disposal in this case is both visible and quick as it unfolds in front of one's own eyes.

The experiential quality of release as part of the letting go process is probably best captured by the practice of celebrating the cherry blossoms. The national flower of Japan lasting only for a few days, cherry blossom is a metaphor for celebrating the evanescence of life, i.e. the fleeting quality of life events that fade away from sight or memory: "*The cherry-blossom petals, without so much as a hint of struggle, will release themselves to the most gentle of breezes as if their very purpose is to fall. The cherry blossom, though tinged with a hint of melancholy, is the very symbol of taking joy in life's brevity. As they flutter to the ground, the petals exude the energy of life […] Wabi-sabi is about appreciating the moment, about appreciating the fleeting nature of all life and all existence*" [Crowley and Crowley, 2005, p. 22].

This quote also emphasises the experience of non-attachment as captured by the wabi concept and is key to the letting go process. Wabi signifies non-dependence upon possessions which are not needed or have outlived their value cluttering the physical and emotional space. By letting go, one can experience a renewed sense of freedom [Powell, 2004]. Key to release and drift-based disposal practice is the preservation of the integrity of the digital artefacts. They remain intact, they do not decay or transform, and their spatial movement is away from the ritual protagonists. The movement might be enacted through reference to natural elements such as flowing water or moving air. In order to design for release and fluid movement, we could imagine new forms of interactions around the experiential quality of release and letting go, be that related to hand gestures or bodily rhythm such as breathing out or relaxing [Khut et al., 2011; Sas and Chopra, 2015] which may cause the disposal of cherished artefacts.

6.2. Supporting Dynamic Disposal: Digital Craft for Disposal - Repurposing and Unmaking

Release-based disposal emphasises the artefact's movement away while preserving its integrity. In contrast, the rest of the disposal practices identified in our findings focus on the artefact's fragmentation, either quickly and visibly, or slowly and covertly. This design implication is inspired by the former: the quick and visible disposal practices which lead to an artefact's immediate fragmentation. Here we think of an ex partner's photos and love letters which are cut, torn or burned, or wedding rings that are melted and crafted into new objects.

The value of digital craft in dealing with grief has been previously suggested [Hoven et al., 2008, Massimi and Baecker, 2011, Sas and Whittaker, 2013] particularly for reclaiming agency during grief and for supporting sense making following the experience of loss. These directions acknowledge the value of art therapy in grief and the process of crafting new artefacts for processing grief, while aligning with the traditional defining of craft as the making of new objects through some skilled practice.

Our findings suggest a broader understanding of craft to include not only the making but also the *repurposing* and even the *unmaking of artefacts*. We have seen accounts of repurposing cherished jewelry, i.e., transforming a melted wedding ring into a necklace. This ensures that once emotionally disinvested, the preciousness of their physical material, i.e. gold, continues to be valued and enjoyed. This echoes the preciousness as a desired material quality in digital jewelry design [Tsaknaki et al., 2015]. In addition, we have also seen accounts of an ex partner's photos and love letters which are meticulously cut or torn. While the level of skill involved in such actions is not as significant as that required for the making of things, the process and intention behind the actions are nevertheless very relevant.

The emphasis on the unmaking opens up design opportunities focusing on how digital artefacts might be made to disappear as a result of human actions. This perspective argues for a more holistic view of interaction design that goes beyond the current limited focus on the generation and storage of digital content, to include also reconstruction and deconstruction. Such an approach echoes current efforts towards the management of electronic waste or the design for destruction in architectural domain [McKeracher, 2014].

In particular, our findings emphasize the importance of bodily movements in the crafting process of repurposing and unmaking, which have been less explored. Hence, we suggest the value of opening up new design opportunities to support fragmentation and to explore new forms of interactions to consciously encourage destruction, deconstruction and transformation. For example, such interactions could harness movement-intensive actions, such as shaking, breaking and throwing, while supporting the visibility of the disposal action within a longer time frame than the one involved in deletion, but still shorter than decomposition or dissolution. Hence, the process of active deconstruction could unfold in front of one's eyes and be entirely controlled and witnessed by the ritual's protagonist. Our findings also show that transformation of the digital content might lead to residues, fragments or newly crafted artefacts. For the latter, digital affordances might be explored to transform digital content across modalities. For example, a grief letter could be transformed into music [Gonzales et al., 2010], supporting richer ritual experience.

The experiential quality of unmaking is the empowerment of the agency of human body and its movement in a process that breaks the old emotional pattern in order to make room for renewal. Wabi-sabi particularly celebrates crafted, handmade unique objects and the understated beauty of their imperfections. This is probably best illustrated in the tea ceremony with its pottery made through raku, a process of rapid firing and cooling of glazed clay pots which ensures cracks of an unpredictable beauty, further accentuated by the black ink rubbed into the cracks [Juniper, 2003].

The cathartic uncanny value of breaking a physical object has been previously emphasised in HCI with respect to the practice of making and repair [Ikemiya and Rosner, 2014]. An appreciation for the practice of fragmentation has also started to emerge, with Bell [2011] sketching a vocabulary of the fragmented, applied to jewelry design, i.e. cut, grind, slice, smash, squash, burn etc.

6.3. Supporting Covert Disposal: Organically Dying Artefacts

This design implication is inspired by the findings indicating covert disposal, i.e. passive, slow and hidden through decomposition or dissolution. It suggests an approach to interaction design that sensitively accounts for the cycle of life that is the hallmark of the natural world. In particular it aims to challenge the assumption that digital artefacts are typically designed to last indefinitely [Kirk and Sellen, 2010]. This is particularly important as our findings also confirm the problems surrounding the permanent nature of

symbolic digital possessions when these signify relationships that have now radically changed [Sas and Whittaker, 2013]. They suggest that limited binary digital disposal, i.e. deletion, should be significantly rethought, so that digital artefacts can undergo natural processes of dying and erosion intrinsic to the natural world [Odom et al., 2010a, 2010b]. Such natural processes occur outside people's agency, and tend to be slow and hidden.

For this, we can build on previous HCI interest in nature and its potential to inspire interaction design [Haeckel, 2012]. For example, work in Affective Health has explored the representation of previous emotional states inspired by the image of leaves falling to the ground, building layers of historical data [Sanches et al, 2010]. Particularly relevant is Döring and colleagues' work [2013] on *ephemeral design* that values the aesthetics of short lived interface components. They suggest the use of ephemeral materials such as ice, fog, clay, perfume or wax that entail strong sensorial experiences, intentionally designed to last a limited time. The authors emphasise the semantic and cultural meaning of elements such as water, air, earth and fire and their intrinsic properties to be harnessed in interaction, i.e. disappearance, degradation or destruction. They conclude by proposing new design tools for material focused user interfaces exploiting novel interaction vocabulary and smart materials from nano and material sciences.

We further build on these insights, suggesting the value of the natural elements for both input and output components of the interface, as well as for storage and hardware. Possible directions are to rethink digital storage and augment physical artefacts with digital affordances. Thus, we could design for *fragile and ephemeral storage* rather than making it permanent and robust, like it is now. Our study suggests the value of the natural elements such as earth and water and their intrinsic qualities of decomposing, dissolving and renewal. For example, one could imagine future technologies making use of self-dissolving [InnovationNews, 2012] or biodegradable transient electronics [Hwang et al., 2012] to contain symbolic digital possessions. Such technologies could be physically disposed of through dissolution or decomposition. An even more radical thought might be burial-informed digital storage, for example through *cut-and-paste storage,* where digital containers store never-to-be-retrieved content after removing it from its source. The materiality of such containers might add to such burial-informed storage. For example, hand-made cases for USB or memory cards, crafted from wood or clay or might add valuable sustainable qualities to such disposal practices. Or natural materials such as stones could be computationally augmented as containers for symbolic digital possessions. Such digital content could capture the essence of the relationship and its associated grief. Disposing of its container may render one's remaining possessions emotionally disinvested, with limited need to further curate them.

The experiential aspect of imbuing the digital with an organically dying quality resonates well with the impermanence principle of Wabi-sabi philosophy which promotes consideration and contemplation for the transient qualities of all life [Cooper, 2013]. The concept of impermanence argues that nothing endures and everything is every changing. For this, wabi-sabi objects are made of natural materials which show well and celebrate the patina that comes with the passage of time [Juniper, 2003]. Indeed, as our findings have shown, disposal practices are often applied to jewelry and inorganic objects such as stone, crystal and clay.

Our findings also indicate that the current focus on curating collections may be less relevant in ritualistic disposal. It appears that with disposal it is not the *number* of objects that matters, but the emotional *meaning* attached to them. A single highly symbolic object may symbolize the relationship, just as larger collections do. Future work should explore if this also holds true for digital artefacts: is ritual disposal of a crafted digital artefact imbued with relationship symbolism also sufficient to process grief? This is an important

research direction as previous work has shown that people own large collections of treasured physical [Odom 2010b, Odom 2011; Petrelli et al., 2008] and digital possessions [Sas and Whittaker, 2013] which can become problematic with the loss of the loved one [Sas and Whittaker, 2013]. Findings also suggest that when confronted with painful memories cued by digital possessions, most people attempt to delete the bulk of them [Sas and Whittaker, 2013]. But it is difficult to harvest these possessions from various devices, platforms and services to enable such wholescale deletion. Embedding digital artefacts in physical objects also allows for the materialization of grief associated with digital possessions [Sas and Whittaker, 2013], and supports agentic disposal practices. It also has the benefit of addressing the current limited role of the body in deletion.

6.4. Supporting Slow and Visible Disposal: Nature-Inspired Design

Unlike the suggestions above which aim to support the disposal strategies identified throughout the interviews, slow visible disposal, which we called organic strategy, is a practice for which we found limited empirical evidence. This may be because the physical realm lacks the ability to support these properties simultaneously; disposal is either slow and hidden, or quick and visible. However, both visibility and slowness are valuable qualities which digital disposal through deletion currently lacks, but which may be potentially supported.

For example, we may imagine new ways for making visible processes which evolve slowly in time. Disposal through dissolution or decomposition involves object fragmentation which occurs underwater or in the ground, being both hidden and slow. In contrast, we may think of interfaces where abstract representations of digital content to be disposed of slowly fragments in time, just like under the force of the elements and the passage of time, while being intentionally open to scrutiny. This is particularly interesting in the case of renewal, where we could think of nature-inspired digital art forms which can develop from "seeds" to blooming, marking the transformation of the digital content "buried" at their roots.

The experiential quality of witnessing renewal is potentially transformative and aesthetically engaging. It also brings to mind the wabi-sabi principle of incompleteness: all things are in a constant state of becoming or dissolving; growing or dying [Crowley and Crowley, 2005]. Wabi-sabi particularly celebrates moments of inception and subsiding which tend to be more subtle and ephemeral requiring slowing down and patient attention [Koren, 1994]. Here we can think of a new type of organic materials that may inspire interaction design, i.e. seeds and their regenerative power. Various arts traditions have already explored the potential of plants and seeds as material for design [Dunphy, et al., 2012]

Table 3 shows that three more cells are currently not populated by any of the physical practices identified in our findings. Just like nature inspired digital art to support slow, visible and passive disposal, innovative interfaces may be designed to address what we call **transparent** disposal, i.e., slow, visible and active, continual disposal, i.e., slow, hidden and active, as well as **transient** disposal, i.e., hidden and quick. These can open up additional design opportunities.

7. CONCLUSIONS

We conducted an interview study to understand rituals of letting go and the qualities of the experience when disposing of symbolic objects. People dispose of individual highly symbolic personal possessions representing their relationship with the lost loved one. Chosen objects tend to be physical, small, and handheld such as jewelry or handwritten letters, but photos are seldom chosen. Personal possessions are not the only things to be ritualistically disposed

of, as people also create or select new inorganic objects that they imbue with relationship symbolism. Stones representing the marital bond might be released into flowing water to drift away, clay vessels symbolizing the relationship's journey could be left to dissolve in a river, while flower seeds might be sown in the ground to mark renewal and moving on. We also discovered a relationship between disposal practices and these symbolic objects, with personal possessions, grief letters, and natural objects being passively disposed of, while wedding rings, love letters and photos are actively disposed of. The role of emotions in ritual processes and their relationship to the disposal actions was also characterized, with anger leading to a desire to transform, while sadness to a desire to release.

Study findings provide a deeper understanding of the concept of letting go, emphasizing the importance of bodily actions and physical manipulation of symbolic objects in ritualistic disposal. We identified a basic vocabulary of disposal practices varying in temporality, visibility and force, to further support this conceptualization. Through a critical exploration of the properties of physical and digital possessions and their affordances for disposal, several design implications emerged. These include new interaction modalities leveraging the experience of release rather than touching, holding or grasping; digital craft enabling artefact repurposing or fragmentation over time, organically dying artefacts, and nature-inspired design. The design of technologies for letting go must consider these findings and the embodied metaphors associated with these practices.

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