P.S. I love you : understanding the impact of posthumous digital messages

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"PS. I Love You": Understanding the Impact of Posthumous Digital Messages

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ABSTRACT

A number of digital platforms and services have recently emerged that allow users to create posthumous forms of communication, effectively arranging for the delivery of messages from 'beyond the grave'. Despite some evidence of interest and popularity of these services, little is known about how posthumous messages may impact the people who receive them. We present a qualitative study that explores the type of experiences potentially triggered upon receiving such messages. Our findings firstly suggest that posthumous messaging services have the potential to alter the relationship between the bereaved and the deceased, and secondly provide insight into how users make sense of this altered relationship. Through the inference of a set of design considerations for posthumous communication services, we reveal a number of conflicts that are not easily solvable through technological means alone, and which may serve as starting points for further research. Our work extends the growing body of research that is concerned with digital interactions related to death and dying.

Author Keywords

Social media; death; dying; memorial; remembrance; grief.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Faced with the end-of-life, individuals often commence the process of 'putting their affairs in order.' This process can include a range of different activities, one of which is the authoring of farewell letters, notes or messages to loved ones, with the intention that these are to be read after the individual dies [24]. Previous research from the field of thanatology, the discipline that is concerned with the study of death and dying, describes the generally comforting, positive nature of perceived interactions between the living and the deceased; for example through dreams [58] or spiritual experiences [49], or, indeed, through final messages left for close loved ones [47]. Whereas final messages have traditionally been left using physical media (paper, cards, notes) [e.g. 13], it is clear that digital services and platforms offer new and extended opportunities for people to leave messages for loved ones "from beyond the grave". Recently, a number of online platforms and services, for example Dead Social[1], Farewell for Now[2], If I Die[3], and My Wonderful Life[4], have emerged, which allow users to record digital messages that are subsequently sent to friends and family, or posted to their social media accounts, *after their death* (hereafter referred to as posthumous communication services). Though exact usage figures for such services are difficult to obtain, the public appetite for them appears strong; Dead Social continue to receive national press attention in the UK[5] and even organize their own convention[6], whilst new competitor services are emerging on a regular basis[7]. Given this interest in posthumous communication services, we argue that the impact on those receiving posthumous messages should be better understood [e.g. see 33, 35].

Our study complements and extends the emerging body of research in HCI regarding the practice of commemorating and remembering deceased friends and family via social media and other digital platforms and services [9, 10, 11, 32]. Our specific focus is, however, the reverse practice:

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[1] http://www.deadsoci.al

[2] http://www.farewellfornow.com

[3] http://www.ifidie.net

[4] http://www.mywonderfullife.com

[5] E.g. see recent Daily Mail coverage "Want to live (online) forever? Morbid website Dead Social allows users to stay active on social media AFTER they die" from Sept 2015 http://www.dailymail.co.uk/femail/article-3238524

[6] http://digitallegacyconference.com

[7] E.g. Safebeyond.com emerged during this research

whereby the *deceased digitally communicate with the living*. With some exceptions [see 7, 8, 44], we assert that this is a practice that has received relatively little attention from the research community. In order to better understand this practice we define a set of design requirements for posthumous communication services that demonstrate consideration and empathy for people who encounter them. These were based upon a qualitative study in which we interviewed social media users to explore potential reactions to receiving posthumous messages.

Our findings suggest that there is a need for flexibility in the design of posthumous communication services in order to take into account the individualistic nature of grief. Moreover, in order to prevent unnecessary distress, our work also indicates that it is essential that the experiences of many actors must be considered when designing these services, not just those who choose to purchase the service (i.e., the person who leaves messages). The contribution of this paper is thus an expansion of the HCI literature that focuses on thanatological digital design, through identifying and exploring conflicts of interest that may emerge between the living and deceased consumers of posthumous communication technology.

The remainder of our paper is structured as follows: firstly we provide a review and discussion of the existing research concerning death and technology, and the psychology of bereavement. We report on the analysis of semi-structured interviews, followed by a discussion of how the emergent themes identify considerations directly relevant to the thanatologically sensitive design of social technology.

BACKGROUND AND RELATED WORK

In this section we provide a review of relevant literature, of previous work, and of technological developments, in the area of thanatological design. We show that designers and developers have considered how individuals use technology to mourn, to be remembered, and to document the process of death, but have not properly explored how the technologically preserved presence or identity of the deceased affects those who mourn them.

Death, Dying and Social Technology

The growing body of literature concerning death, dying, and social technology highlights the way that individuals make use of social media to document their death [2, 31, 40, 42], to mourn for those that have died [12, 19, 25, 30], to provide emotional support for the bereaved [27, 54] and to provide and seek practical and emotional support for those at the end of life [50, 56]. From physical tombs and gravestones that mark the final resting place of the deceased, and monuments that act as memorials of lives lost in conflict or disaster, to spontaneous shrines that mark sites where people have lost lives, *spaces* where the bereaved can memorialise loved ones have existed in some form across human history. With print media came the obituary, and then with the Internet obituaries and memorials were shifted online [22]. Indeed, it has become somewhat the norm that social network site users will communicate their grief by paying respects for their deceased friend via the Internet [e.g. 11, 12, 37]. In other examples of the phenomena, users create specific spaces in which they can grieve [25]. Analogies have been made between these social media commemorations and gravestones, in that users visit a (virtual) space in which to actively mourn for individuals who have died [9, 15].

Online Memorials

There are many places online where people can mourn those that have died. The World Wide Cemetery, explored by Roberts [46], is a dedicated space where individuals can place memorials for their loved ones. However, memorials do not necessarily need to be in a dedicated space. For example, Facebook will memorialise the accounts of the deceased on the request of family members. This process was introduced following complaints that users were being encouraged to interact with deceased members [29]. When accounts are memorialised, the profile of the deceased user remains online, allowing members of their personal social network to mourn them. Research examining how individuals use memorial sites has found that those who are in mourning exhibit behaviour that resembles a continuation of the relationship with the deceased [12, 23]. For example, DeGroot [12] found that people using a Facebook group created as a memorial addressed the deceased directly in their messages, and indicated that they still felt the presence of the deceased in the group. This finding should not be hugely surprising, since the perception of a continuing relationship is a well-established component of the grieving process more generally [41]. For example, individuals often imagine the presence of their deceased loved ones, and reconnect with the deceased through activities, conversations with others, and imagined interactions [14]. The novel experience offered by posthumous communication services is the possibility of real messages from the deceased forming part of this imagined continuing relationship.

Posthumous Communication Services

Several well-known social media account-management tools, such as Tweetdeck and Hootsuite, allow users to schedule messages to be posted, on their behalf, days, weeks, and months into the future. Posthumous communication services can be read as an extension and refinement of this functionality, allowing users to post messages to social media accounts in a manner that is disconnected from the time they were written (see [48] for a lengthy discussion of the implications of disregarding chronological constraints on behaviour). However, posthumous communication services more specifically acknowledge and frame those messages as being "from the grave," and aim to improve the satisfaction and acceptability of that process. For example, with *Dead Social,* a "digital executor," or nominated individual, must activate the service after the user has died, giving the living

some control over whether or not the posthumous communications are sent.

No existing research has investigated the factors that may affect the usefulness, satisfaction and acceptability of these services. Given their growing popularity, and the potential for any problems they create to last for a long time, we suggest that the exploration of posthumous communication services is timely. However, we are aware of only one previous piece of research that explored technology that allows the sending of messages on behalf of a deceased user: the *Blogging by the Dead* service conceptualized by Hall, Bosevski, and Larkin [20] employed geographically based technology in the form of messages linked to GPS co-ordinates. These were communicated via mobile technology to those mourning them at a specific location. Participants generally held positive attitudes towards the technology, but were concerned about lack of privacy regarding access to the messages the participants would leave. Notably, Hall et al. [20] only examine the service from the perspective of those leaving the messages. Our work builds upon theirs by examining how posthumous messages can affect the bereaved.

Thanatosensitive Design

Posthumous communication services would appear to embrace the fundamental ethos of *thanatosensitive design*, a critical design ideology that encourages designers and developers to consciously consider the ways that the death of users affects those users' relationship with technology [33, 34, 35, 36, 40]. Thanatosensitive design is emerging as a mainstream approach to technology design; in Japan, for instance, Yahoo has created a thanatosensitive process for those undergoing "*shukatsu,*" translated as the process of preparing for death. In the platform, termed *Yahoo Ending,* users can, for instance, do this by leaving messages for their loved ones, a service similar in nature to the third-party applications that we focus on in this study.

Massimi [35] describes a "poltergeist moment" experienced by an individual when her deceased mother's caller ID appears on her phone, highlighting her mixed reactions of fear and hope. Massimi recognises the potential negative effects on the bereaved of digital identities persisting after death. In the case of posthumous communication services, the potentially unexpected presence of the deceased is an intentional feature of the technology. In this context, it is important to acknowledge that the users of posthumous communication services are not the only consumer of the product. They may pay for the service, create an account and propagate that account with information, but those actions then have the potential to affect a large number of unsuspecting people for years into the future.

A STUDY OF USER REACTIONS TO POSTHUMOUS MESSAGES ON SOCIAL MEDIA

We wished to explore attitudes towards posthumous online communication from the perspective of the bereaved. In order to do so, we interviewed social network site users, using a qualitative methodology informed by thanatological HCI literature [e.g. 9, 39]. Our approach was to prompt potential message recipients to predict their reactions to receiving messages, from loved ones, from beyond the grave. We are aware that this approach, in which we asked people to predict how they would feel in hypothetical future scenarios, has some limitations. For instance, the concept of *affective forecasting*, or making predictions about future feelings, has been studied extensively [57] and can often reveal over-exaggerated expectations of negative affect [18]. However, we argue that it is very difficult to determine a 'correct' period in which to ask people about how they feel about the implications of potential thanatological design. Participants in the present cannot give any certainty about how they might respond a week, a month or a year hence. This is as true for those who have experienced loss, as it is for those who anticipate it.

We would suggest, further, that the selection of participants to inform thanatological design is uniquely problematic and continues to provide a methodological challenge for researchers working in this space. In our work, we have drawn on parallels with everyday practices used in the design of end of life or palliative care, in which a common approach is to co-design services by asking individuals or their carers to anticipate their future needs. For instance, Hebert et al [21] note that "few events are as imbued with uncertainty as death and dying." The same researchers conducted a study where they interviewed caregivers who were anticipating the death of a loved one, as well as caregivers who were recently bereaved. Results indicated that individuals' expectations differed hugely one from the other, and it was these *individual* differences, rather than differences between those pre and post bereavement, that were most interesting. Moreover, the actual experience of loss did not reduce uncertainty about the future.

In our work, therefore, we also acknowledge that the grieving experience, and therefore the reception of these messages, is very much an individual one and do not seek to generalize these findings to the population, but rather to draw attention to the perspective of *potential* consumers of posthumous communication services. Finally, we also add that our approach is analogous to other recent work by the HCI community that has used qualitative methods and critical design approaches to explore, and *problematize*, the impact of upstream technology (e.g. see [3 28]).

Participants

The decision was made to select participants from a population of current Facebook users to ascertain their reactions to posthumous communication services. That is, we deliberately chose *not* to target users who had already been through the experience of receiving posthumous digital messages. This decision was both a practical one, and one based on ethical concerns surrounding the active targeting of a group of bereaved users to discuss their experiences. However, whilst participants who had

experienced death were not specifically targeted, all but three of the participants volunteered information about their own experiences of bereavement.

Participants were recruited from staff and students at the University of Lincoln and Sheffield Hallam University in the UK. A total of 14 participants were recruited, 7 males, and 7 females. All participants were regular users of Facebook, and (with two exceptions) were naïve with regard to the third-party services described above. Recruitment of participants ceased once coding of data from semi-structured interviews reached saturation.

Procedure

After obtaining informed consent, participants were shown a YouTube video created by DeadSocial[8]. The video was chosen as it gives a clear introduction to the technology, including features of the DeadSocial posthumous communication application. There then followed a semi-structured interview, which lasted between 20 and 40 minutes, in which participants were initially asked for their understanding of these posthumous services. The interviews explored reactions to the services together with hypothetical reactions to post mortem messages, and issues attached to the individual roles of users (the dying), consumers (the bereaved), and digital executors in the process.

Audio recordings were made of the interviews, these were then transcribed. A thematic analysis was then conducted on the transcripts, sentences were open coded and reduced into themes via axial coding as per the procedure outlined by Braun and Clarke [6]. Open coding produced 28 codes, the data was then interrogated and reduced to 20 categories, the data was examined once more to ascertain any exceptions to categories and identify incorrectly coded data, refining the analysis further to 19 categories. The data in these categories were axially coded to identify similarities and relationships between categories.

FINDINGS AND DISCUSSION

Our analysis identified five themes: *Preparedness, Control, Connecting, Artificiality,* and *Mortality*. The first two of these are related firmly to an individual's grieving process and address the ways that posthumous messages may align with that process and influence their willingness to accept the loss of a loved one. The final three relate to the fact that these forms of posthumous communication transcend our normal understanding of loss and are associated with new forms of societal response to death. We therefore now discuss the five themes under the sub-headings of Grieving and Transcendence.

Grieving

Grief is a very individual experience that will in part reflect a person's preparedness for loss. For many years the psychological literature around grief discussed 'grief work' – the need to *work through* thoughts and feelings about loss and to relinquish the bond with the deceased [5]. We now know more about the ways that individuals differ in terms of their emotional preparedness for loss and their ability to gain control of their feelings during the grieving process. These two issues, *preparedness* and *control*, emerged as strong themes in our interview material.

Theme -Preparedness

When asked to imagine their personal responses to the receipt of posthumous messages, participants reflected firstly upon the fact that individuals do not always experience grief in the same way:

"I've had family and friends die, […] I've had that experience but I don't think you ever forget them. You remember them in your own way […] because the one thing that has become very clear to me over this last couple of year is that there is no bloody handbook for this you know everybody deals with bereavement in their own way, there is no point going to a you know -- somebody says "do this it might be a comfort" *[P2]*

"[…] it's such an emotional thing, having people leave you and it's a hardest thing I believe we go through" *[P2]*

"it might not allow for people to move on if they're still getting messages from people who have passed away it might be difficult, some people might see it as difficult" *[P6]*

It is interesting to note, with regard to this last comment, that many individuals chose avoidant coping strategies during grief [38], preferring to distract or sedate themselves to help them through the process. Indeed, studies have shown that this strategy can be highly functional [53]. Thus, we can see how posthumous messages might fail to support those choosing such an avoidant coping strategy. We assert therefore that it is important to consider the match between the wishes of the deceased and the emotional preparedness of the bereaved to receive and accept messages during the grieving process, an issue repeatedly recognized by our participants:

"I think it would be (pause) a you might have a conflict between wanting to respect the dead person's wishes and wondering what effect the messages would have on the people who receive them." *[P1]*

"I can just see that perhaps if they were in the wrong state of mind when they made the postings, for these postings to continually come out, it could exacerbate any leftover problems for the families. But likewise I could see it as being such a comforter for other families." *[P3]*

"At the time they are writing the posts and stuff they might feel angry and want to get it out, but I think at the end of the day you wouldn't want to be remembered for being awful and bitter" *[P11]*

"[…] it might bring some people happiness. It depends what medium you are used to. Younger generations who are

[8] http://youtu.be/mnwX3O902xQ

more used to communicating might find it perfectly acceptable. I mean I'm kind of on the borderline because I've kind of grown up with kind of both, so I can see both sides of it but um, yeah I think it could be extremely distressing to someone who wasn't particularly au fait with the medium." *[P7]*

Participants 3 and 7 were among those who highlighted the potential danger of these posthumous services being co-opted as media through which users could deliver suicide notes. The context of their state of mind being primary to their purpose in using the service:

"[The developers of these services are] *assuming that the people who have died have been fairly content before they die, and therefore the messages that they have left were when they were of sound mind and body and happy. Whereas I mean in the case of the guy last week, he killed himself so he could, so imagine his state of mind and what he could put and how traumatic his posting might be" [P3]*

"I doubt people would want to write unhappy things on it, unless they were, unless they were suicidal or otherwise suffering, erm, and had deliberately used the system to set up all their suicide notes and then killed themselves and released it. I think that is one of the only circumstances where you would have unhappy messages, because generally speaking people don't want to leave unhappy reminders behind unless they died by their own hand, do you know what I mean?" *[P7]*

It is true that in the case of Deadsoci.al there is a report facility to be used in the event of malicious or unpleasant messages being distributed via the service. However, this places responsibility for the messages once more in the hands of the bereaved:

"if you could enable it so that users who didn't want to see that could like block [these services] *just block that so they didn't have to see that, and then it becomes -- it's a consensual thing if they want to see messages from it."* *[P7]*

"So I wouldn't want my immediate family to be left with the responsibility, with everything else that they have going on, to do that." *[P3]*

Participants thought recipients might struggle with possible deactivation of the service (because of distressing content) as they might fear missing out on future messages that they would find comforting at a later date.

"I think actually there should be a way to say "no more" but not unfriend them or you know lose contact with the memories, but you should be able to say "I don't want any more" but then! (laughs) what if you did that and then spent the rest of your life erm wondering you know "have I done the right thing what else were they going to say to me". *[P4]*

Because this service is so new (Participant 2 remarked *"It's not happened before. Yeah. I would read it and can imagine getting quite upset from reading it […]*" and Participant 11 describes the service as *"alien"),* participants often used the analogy of offline memorials or rituals such as letters left by the dying or memory boxes left for the bereaved:

"[…], it's a bit like people leave er memory boxes for their children. Maybe this is just a virtual way of doing that it, but maybe not the whole, not posting stuff on Facebook and liking stuff which might freak people out but if you have a message every year for your daughter as she's growing up or something, that might be the same sort of thing as a memory box." *[P1]*

"You go to a funeral and you say good bye and you have a grave and you can go and talk to someone at the grave but they don't talk about erm they don't talk back to you do they?" *[P4]*

However the consideration of the technology in an offline context went beyond the analogy, with the participants weighing up the validity and emotional impact of an electronic last message:

"There's no real difference between a physical um letter, and an email, I suppose you could print the email out -- but there is a kind of innate emotional thing about the process of creation. I think that humans are really hung up on the idea of writing something by hand and sealing it and delivering it rather than typing it out and sending it -- even though really there is no essential difference." *[P7]*

"It's not like leaving letters for people that are personal is it? It's not like leaving um er letters for your family saying "goodbye I love you" and like that. It's being doing erm making stuff for yourself." *[P4]*

The context of the message was also an important factor in our participants' attitude towards the service, however there was no agreement as to whether a direct message or a more general 'status update' type message would be preferred:

"I think that if on your death this service sent personalized messages to everyone who you told it to, rather than sending out generic tweets and Facebook post for everyone to see it would be a far more appropriate service." *[P7]*

"I think I would probably have a different response […] *if it popped up in the main bit you would have positive, if it popped up as a personal message then it might be a bit too I don't know, raw?"* *[P3]*

Theme - Control

Continuing the theme of personal and emotional impact of the posthumous messages the *control* theme addresses the question of whether or not offline messages afford the bereaved (the consumer) some ability to control their grieving process. We noted earlier that individuals choose different strategies to help them cope with grief and to regulate their emotions [5]. To a certain extent, these

posthumous messages can serve to remove or reduce emotion control. Participants spoke about the absence of control that is usually afforded to the bereaved:

"*Erm, the thing is it kind of gets delivered doesn't it? You don't get a say. It is delivered to you. And if it was on Twitter or Facebook it would pop up on your feed - you would not have the option to open that email or not* […] *if it was a physical card or letter that someone had left you, you have the choice to sit with it for a day or two to build up to opening."* *[P9]*

"With these things the control is with the person who has died, they are still saying when you will be shown them. I think if that happened I might be tempted to abandon my online social network until I had, until I was feeling strong enough to cope with any messages." *[P13]*

This was a common theme, with Participant 11 clearly illustrating the paradox of the added control the technology afforded the users that accompanies the diminished control afforded to the recipients of posthumous messages:

"I think that would be horrible. It's like it can be a huge comfort but there are all these other ways in which it could go wrong I think it is a comfort for the person leaving these messages but it stops there, the person reading them has no control. […] *But in the same breath these will allow people to edit won't they? Like letters are there, they are a finished thing. You could edit posts and messages depending on your life."* *[P11]*

Participants identified the potential for distress if people were not expecting to receive these posthumous messages:

"I don't know, you would just, I think you would be a bit, that would a bit unnerving but if you knew it was a set, even if the first one said "this is being programmed by something" before they are dead, then that would probably be ok, but I think if something just suddenly popped up… But it is a nice way to remember how things were (laughs) but I think it could scare the living daylights out of me (laughs)." *[P3]*

"I think that confusion is going to be a big part of it, people are going to be like "I thought they were dead" um because obviously it says "declare on your first message that you are dead". Not everyone reads every single post on Facebook and if you have preface every single tweet with 'I am dead' like you're wasting characters for a start." *[P7]*

Some participants gave full consideration to the need for an executor role – arguing the importance of having a living person who could take responsibility for the messages.

"Erm I probably, like I said, I would probably ask people about it first. I wouldn't just go off and do it anyway, just in case it had implications for other people I would probably think about it first." *[P8]*

"The only thing that would made me say no [to accepting the executor role] *would be if the person was leaving surprise messages or if they hadn't discussed it with their family first. I wouldn't want to be responsible for upsetting people."* *[P13]*

"So I would probably say that you would almost have to ask an executor who isn't part of the like, of the immediate family group." *[P3]*

The executor role was something that polarized participants, with some viewing the role positively in terms of the new responsibility but others highlighting the pressure that would accompany the role:

"[…] *erm you know responsibility works both ways it's a lot to ask but it is also erm it means that you trust them with a lot."* *[P4]*

"[activating the account] *might start a mini mourning period again and I wouldn't want to the responsibility no."* *[P9]*

Issues over ownership and control over the profile of a deceased user were important. Participants were not in consensus as to who would have ultimate control over the profile of the deceased, described by Brubaker and colleagues as "stewardship" [8], a contentious issue frequently misunderstood by users of the technology:

"Facebook doesn't know when you die does it? Um although it would be very interesting if they put a cap on it, if they work out that you're 110 that they will automatically close your Facebook site down, that may come in you never know. I, I would leave that down to, to family." *[P2]*

Firstly, Brubaker et al [8] describe the way that services such as Google are beginning to employ processes that automatically shut down accounts after period of activity; in instances where users have employed posthumous technology to post on their behalf after death this automatic inactivation of accounts would not happen. In eighty years we could find ourselves in the bizarre situation where a set of social media profiles of deceased individuals are engaged in frequent communication with each other.

Secondly, the misconception that family has the ultimate control over this technology is common:

"it might be that some of the immediate family don't agree with it, or don't want it and therefore could block it." *[P3]*

Whereas in fact the service itself has the ultimate control over the status of a user's profile:

"[…] her parents want to see her Facebook because her, and um, and then they didn't have her password and in the end it was going to get closed down 'cause Facebook said that they owned it, they own everything." *[P1]*

McEwen and Scheaffer [37] talk about *Wizard of Oz* profiles, where accounts of the deceased are administered by an unknown individual who continues to maintain a presence in the guise of the deceased. Participant 12

describes a situation where this happened and caused distress:

"A friend of mine died a while ago this is before Facebook but he still, I knew him online only really. When he died a while after we started to see posts from him and it was unnerving to begin with because they weren't about stuff he did although we all knew he was dead! But it used his profile photo and his name and it turned up on our friend pages. It turned out his girlfriend was using his account. She upset a lot of people because she was talking about her new life and things. It was awful it was like it spoilt our memory of him." [P12]

So whilst users may be comfortable, as Participant 14 says, to disclose their password *"[…] to a good friend, and let them shut it down. Or they could keep it open. It would be up to them I suppose."* they could be creating a potentially distressing situation for those that grieve for them. There are also potential problems caused by messages from the deceased impacting on the future relationships of the bereaved:

"if I sent a message to the partner I was with when I died I, I wouldn't do that because I would want them to move on, I wouldn't want them to dwell on the past I guess" [P10]

"I mean what if your partner died and continues to have an input into your life and you've like moved on. I mean I don't mean you've stopped loving or caring for them, but what if you have met someone else, that you are in love with someone else and you keep getting messages from your ex, um is it ex? Late! Late partner. And these messages are telling you that your late partner will always love them and that they hope that they wouldn't forget them. That is going to be hard isn't it? When is it over? It's almost like they are stalking you from beyond the grave." [P11]

Similarly, just as participants identified a risk these services could pose in terms of arresting the grieving process in terms of anticipating and expecting new content from the deceased. Participant 12 asked *"when do the messages stop? When would be the next one?"*, the potential psychological effect of this anticipation was illustrated by Participant 11:

"I think if, if this was happening all the time on your Facebook if someone was sending messages and updating their Facebook after you had died, I mean after they had died well that would either… It could do two things really, you could get used to it and it wouldn't be a shock and you could be waiting for the next one to happen, or it could be a horrible shock every time and you would be waiting for the next one too, but it would be like dreading it because you wouldn't know it was coming." [P11]

The potential problems of over-anticipation and unwelcome surprises could be addressed through adequate *Planning*. Participant 1 suggested that users give a clear indication of the last message they will leave.

"[…] *it would be good if the person wrote "this is my final message" and then you would know that to have yes to receive random messages would be a bit disturbing possibly." [P1]*

Whilst Participants 14 and 11 advocated an open communication between the users leaving the messages and the bereaved reading them:

"I think that if you weren't expecting it it would be like a punch to the gut. But you know if you were expecting it, like if you were if you knew that the person has set these things up then it might be a comfort to you." [P14]

"I think I would be happy but I would want to sit down with the person who was leaving the messages and make sure they had considered it from the other person's the person who is reading the messages their point of view." [P11]

However, it should be acknowledged that it would obviously not be possible if participants set automatic birthday or anniversary messages, and that these would be anticipated every year, an emotional event described by Massimi [35].

Transcendence

The second over-arching concept was termed *Transcendence,* which addresses the wider notion of a new societal means of responding to death. This was in turn made up of three themes; *Connecting*, *Artificiality*, and *Mortality*. Terming the second over-arching concept "*Transcendence"* may initially sound rather futuristic and, even, reminiscent of science- fiction when applied to the subject of death and technology. However, our analysis shows that these posthumous services do, indeed, transcend. They transcend *Mortality* in that users can extend their documented experiences, they transcend reality in the theme *Artificiality* by providing those consuming the messages left by loved ones with a (admittedly one-sided) dialogue with those who have died, and they transcend communities in the theme *Connecting* by uniting those who are grieving and by connecting the living with the dead in commonly understood ways (described in the thanatological literature as *continued bonds*). These themes are discussed individually in detail below.

Theme - Connecting

The *Connecting* theme describes the ways in which posthumous technology connects worlds, whether they be the word of the living and the dead, or individual groups of the bereaved who can come together to remember and grieve for those who have died. Much has been written in the literature studying death about the notion of bonds persisting between the dead and those grieving for them [12, 14, 16, 26]. Individuals will have conversations with the dead and the person that they grieve for still remains a big part of their life. This was a strong component of the *Connecting* theme with participants talking about using social media to maintain relationships.

"I've also got a friend on Facebook who his sister died a few years ago and it hit him hard, when he does things he tags her in it and talks to her through his profile." [P12]

This connection between the dead and the living was something that the participants could envisage being facilitated by posthumous services. Participant 5 remarked on the possibilities that this new technology could provide:

"I understand memorialization and stuff like that, but you know, I never -- never thought sort of it's always come from the users, it's never come from the actual dead person themselves." [P5]

"So if you are grieving for someone and you are sending messages to them or tagging them in your status updates then you receive messages back, well not back, but I mean messages from them to then that could be a real comfort." [P12]

"If it was sensitive and well-meaning I think it would be nice. Comforting you know. Perhaps because you didn't know that person well enough or long enough when they were alive, it's like that relationship is still ongoing that person is still part of you, you know still having an influence on your life" [P11]

However, the views of the participants regarding the possible continued bonds were not universally positive. Participant 11 goes on to say:

"[…] *when someone has died you do remember the good stuff and if your wife dies you remember them as this good person and remember all the good stuff. So that's hard to deal with the memory of a partner's late wife. But if that wife then still sends your new partner messages, well that's messed up isn't it? How do you cope with new stuff you know that ongoing stuff. Messed up!" [P11]*

Whilst messages from deceased contacts may provoke distress, propelling the bereaved into remembering almost against their will, the "memory trigger" may also give comfort and could bring together those in the deceased's personal social network in grief. The messages communicated by the deceased via this technology are also laying down new memories, connecting the living with the deceased by the introduction of new "interactions".

The *Connecting* theme also describes the way that posthumous technology can unite those who grieve. Participant 5 illustrates this perfectly when he says:

"I think if it was on somebody's wall it really encourages the idea of converging online and you know people would be like "ok so there's been a post from Joe Bloggs who has just died" and all their friends would be like "have you seen the new message from so and so" I think it would encourage people to converge online and sort of memorialize together." [P5]

"[…] all her friends on Facebook that knew each other we left messages for her and comforted each other and it was nice because we were remembering her. It was like we could have been in the same room but we were all on Facebook. It was, you know nice." [P4]

This could be viewed as an extension of the memorializing behaviour that has been previously established [e.g. 11, 12, 37]:

"I think I said at the beginning about um my friend who died. His, like his profile it because this place for well-wishers to go […]*" [P10]*

Theme - Artificiality

Whilst, as illustrated above, this new technology can create new, and strengthen existing bonds between the bereaved, and uniquely maintain bonds between the deceased and the bereaved, a prominent theme was the participant's difficulty accepting the veracity of the communication. Hence our theme *Artificiality* describes the resistance that some participants felt towards posthumous services:

"I think my first reaction would be "who is this misusing their name?" I would assume it was some callous bastard trying to sell me something, because that's generally what most things, most unsolicited pieces of Facebook Twitter or phonecalls are normally some bastard trying to sell you something." [P6]

The above quote is a fitting illustration of the *Artificiality* theme. Participants found it hard to reconcile the new communication as described under *Connecting* and either assumed a sophisticated AI version of their deceased friend as described by Participants 10 and 1 below:

"Because they're not, it's not them, it's… If it, if the thing they were using could reply to me I would know that it's not, it's not them. It's just… um. It's just a machine, it's not actually… no matter how sincere or light authentic it was I would not be able to get past the fact that it's just a machine. It's just something that is churning out messages. It's not the person that I knew. I think that would be very difficult." [P10]

"Maybe it would be positive still, but it would be, it would be difficult to (pause) cut off from the fact that there was no point in replying to them because they weren't there." [P1]

"I think I think it's just that strange thing that ooh they shouldn't be on my Facebook feed umm because they they don't exist anymore" [P2]

This resistance to the technology almost akin to a reverse of The Turing Test [55], here actual human communication is judged to be AI. This may be resolved as these posthumous services become more familiar to social network site users. As Participant 10 optimistically says "*And so perhaps has you say it may go on to be the norm, it may not be, there still might be that strangeness but not the newness of it all."* To draw on the analogies to offline concepts touched on in the *Contextualizing* theme, with increased exposure to messages published via posthumous services, the bereaved

may come to consider them to be just as valid as letters and cards. Zajonc [59] explains how repeated exposure to a stimulus can increase positive emotions towards that stimulus, and also decrease negative emotions. In an extension to the theory of planned behaviour [1], Perugini and Bagozzi's model of goal directed behaviour [45] demonstrates the importance of emotions and experience on the desire to engage in a particular behaviour. Therefore, as these services increase in popularity, an individual who is a regular social media user is more likely to be more receptive towards technology that utilizes that media than someone who has less experience.

Theme - Mortality

The final theme under the over-arching concept of *Transcendence* is *Mortality*. This describes the ways in which posthumous technology affords the users the ability to almost transcend death. Participant 1 describes the motivation for setting up an account:

"*I suppose it's a way of getting over the idea that you're not going to exist and that (pause) there is a cut of point and this eases your transition I suppose, um, possibly for other people and also for yourself thinking that you are not going to be totally gone ."* *[P1]*

This is echoed by Participant 4 who said:

"People are always on Twitter Facebook wanting to say things and be noticed and popular so [pause] so maybe they want to be popular even thought they're not here. Immortality!" *[P4]*

Participant 1 then goes on to talk about motivations for interacting with messages left by the deceased:

"[…] *even though I don't believe in an afterlife or anything it would still feel like they would, they might see it."* *[P1]*

Whilst the ability to transcend mortality is seen to be a major motivation for using posthumous communication services, it was hard for the participants to imagine actually using the services themselves. Predicting that they would outlive Facebook:

"And anyway by the time I'm -- by the time I snuff it Facebook will have disappeared. It will have been replaced by something else by then. I will probably have to leave a hologram of myself (laughs)." *[P6]*

"I've always thought for a while that when in the future when people die they will still have a presence online and I didn't know um I didn't know how it was going to be done or how it would happen but I always thought that somehow the Internet would be able to um continue people's sort of like life online for them and I guess this is the first kind of step in doing that." *[P5]*

This highlights a risk relative to the platform upon which the posthumous services are placed. It was difficult for Participant 6 to trust that the service she used currently would be able to post her messages in the future. This supports the findings of Briggs and Thomas [7] who found that the older adults they interviewed shared these concerns that the identity and digital legacy left by them after their death would simply disappear.

The theme of *Mortality* described the ways in which the participants viewed posthumous technology extending the life of those who had died. Consideration of posthumous technology also led to participants examining their own mortality, particularly in connection with the mortality of the technology itself.

IMPLICATIONS FOR THANATOSENSITIVE DESIGN

Our goal was to better understand the implications of an emergent type of software service that allows people to send time-sensitive messages at dates long into the future, and marketed specifically to people wishing to send messages after their death. This genre of service is unprecedented, and there is little existing research that can help designers and researchers understand potential social or psychological effects on users of using such services. As stated above, our initial intention at the outset if the work was, through discussion with participants and review of relevant previous work and literature, to construct a set of useful design requirements for posthumous communication services that demonstrates consideration and empathy for people who encounter them. Our findings, however, suggest that the issues surrounding this topic are complex and that there seem to be few concrete design solutions that might be capable of maintaining the usefulness and engaging nature of the services, while protecting the people who will encounter them from unnecessary trauma. In fact, these services potentially place people in a number of difficult situations whereby they are manipulated into deciding between maintaining the wishes of the deceased and protecting the best interests of the living.

Below, therefore, we outline five *conflicts* that emerged in our study. Any service that attempts to facilitate the sending of messages beyond the death of the user in a way that demonstrates consideration and empathy for the bereaved must reconcile these conflicts, which also serve as useful, and tangible, starting points for future research on the topic of thanatosensitive design. The intention with this section is to make both the results of our study, and the wider research on the psychology of bereavement, accessible and useful for those who wish to design these types of systems. The first and second considerations directly reflect and highlight well-established findings in research on the psychology of bereavement, specifically addressing issues of context and preparedness. The third and fourth points represent the core novel contribution of the current paper, discussing the duty of care that the deceased (and their proxies) have to the bereaved, as well as privacy concerns. The fifth point discusses potential implications of technological obsolescence.

Conflict #1: individual differences

Situations may arise where the wishes of the deceased directly contradict the wishes of their surviving friends and family. For example, the deceased's family may find the posthumous messages upsetting and seek ways for them to be stopped, while, conversely, others find those messages comforting. It is unclear whether the living should be allowed the ultimate decision, and whose decision should be considered final. Designers would do well to understand the huge individual differences that exist in terms of coping and emotion regulation, recognizing that, for some, a strategy of distraction or distancing themselves from the deceased is most appropriate [5]. They should therefore adopt transparent processes and policies regarding circumstances under which the service is delivered or terminated, including consideration of whether data and messages should be archived with the possibility of reinstatement at a later date. We advocate communication between the person leaving the messages and their family and friends before these services are activated.

Conflict #2: role of executor

The appointment of an executor is an attempt at implementing a process whereby the living have some control over whether messages are sent as planned. However, this executor role places the chosen person in a position where they may be viewed as responsible for any harm or upset caused by the posthumous messages. Since the executor typically does not have access to the content of the messages before they are delivered, they cannot make this decision in an informed manner. Designers must carefully consider whether they allow executors access to the content of messages when making this decision.

Conflict #3: active and passive grief

In a situation where the bereaved find posthumous messages distressing, either through the interruption of normal mourning, or through messages that were sent when the deceased was in an angry or despairing state of mind, there may still be a reluctance for the bereaved to stop the messages being broadcast, out of a fear of missing future messages that they may find comforting. Stroebe and Schut [53] describe the necessity for respite from grieving, and the need for the bereaved to take an active rather than passive role in their grief. Their dual process module posits the need for the bereaved to, *"take time off from the pain of grief,"* and to, *"master the changed environment [in the absence of the deceased],"* in order to adjust to their bereaved status. Research suggests that limiting exposure to emotional stressors during grief is an adaptive coping strategy in the bereaved [4], and that the inability to avoid stressors results in emotional dysregulation in bereaved individuals. This has been found to have adverse psychological and physical effects [43, 51]. Designers must therefore consider whether they have a duty of care and whether they censor, or otherwise manipulate or mediate, potentially harmful messages.

Conflict #4: public versus private messages

Careful consideration must be made regarding the delivery mechanism of posthumous messages; for example whether messages are sent publicly, via services such as Twitter or a Facebook wall, or through a private messaging service such as email. Participants in our study demonstrated conflicting opinions. For example, private messages initially appear the least problematic solution, since they facilitate a more intimate communication and have the potential to upset fewer people. However, a number of participants expressed discomfort with such a direct, personal message. We should also be mindful of the ways in which changing representations of the lost relationship play an important role in the grieving process. In contrast to original theories that would suggest the importance of *relinquishing* a bond with the deceased, more recent interpretations of grief have suggested that, over time, an enduring continued bond with deceased becomes not only a possible, but even beneficial means of meaning making [5]. In other words, the timing of personal messages to the bereaved could potentially support or undermine this crucial process.

Conflict #5: evolution and death of services themselves

Designers must acknowledge that software platforms, especially those used for social interaction, are constantly evolving and changing. Plans made for scheduling Facebook posts in 2030 may not be possible if Facebook no longer exists, or may not have the desired impact if people have moved on to using other platforms. Designers of these services must make a long-term commitment to deliver messages on behalf of deceased users in manner that best approximates the intentions of the deceased. Commercially offering such a service without a robust, long-term (i.e. >20 year), plan for ensuring the delivery of messages could raise a number of legal and statutory issues and could even, for instance, be considered fraudulent.

CONCLUSION

This paper contributes to, and extends, the growing body of research concerned with digital interactions related to death and dying. We present a qualitative study that explores the breadth of experiences expected upon receiving digital posthumous messages. Our study reveals the impact that such emergent message delivery services may have on the relationship between the living and the dead, and highlights the ways in which the dying and the bereaved may interact with such services. We identify links between our findings and those in the literature on the psychology of bereavement. Further, through the process of generating design requirements for posthumous communication services from our findings, we outline a number of complex, human-centered conflicts that are not easily solvable through technological means alone. These conflicts serve as a useful problematisation of the design space, and are suitable starting points for designers of posthumous communication systems. They also, more generally, serve as propositions for future research on the topic of thanatosensitive design.

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