Tech Break Up: A Research Method for Understanding People's Attachment to their Technology

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ABSTRACT

Tech Break Up is an early stage research method that enables researchers to gain insights into ways in which people are attached to technology through improvised "break-ups." Informants verbally reflect on and formally end their relationships with technology that they previously used. The method was used in a study to understand peoples' relationship to technologies that enable creative work and reasons and moments for change in the relationship. This paper provides an overview of the method and its execution. The study reveals three primary factors of detachment for technologies that support creative work: changing self-identity, creative process, and creative ability. This case study suggests that the Tech Break Up Method can provide insights into product attachment to inform the design of new technology while simultaneously providing informants with an immediate positive experience through direct emotional expression to technology.

Author Keywords

Emotion, User Research, Methods, Design, Product Attachment.

ACM Classification Keywords

H.5.2. Information interfaces and presentation: User Interfaces

General Terms

Design

INTRODUCTION

People relate to technology as they relate to people [20]. Just as relationships with people can be emotional, so can relationships with technology. Such emotions influence people's perceptions of a technology, including its usability and functionality [17, 27].
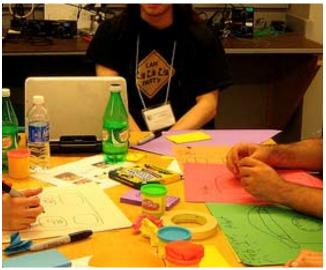
Figure 1. People develop attachments to technologies used to support creative work. Technologies include digital (computers) and non-digital technologies (post-it notes).

The design research community advocates understanding these emotional relationships [5, 17] to improve the usability and functionality of product as well as to increase the lifespan of product use [30]. Product attachment theory explains how people develop emotional attachments to their products through a process of meaning making and identity construction [30]. People invest psychic energy into their products and develop attachment through repeated use over time [2].

Attachment is defined by the strength of the emotional attachment a consumer experiences to a product [23]. Such attachment is to the product rather to the brand [23]. When attached, people may be more likely to repair and less likely to replace when a product no longer functions [11, 24].

Studies of attachment to consumer products such as lamps, clocks, cars, and ornaments, reveal a number of factors that may influence product attachment [23]. Some are inherent in the product, such as its utility, market value, and reliability. Others are more dependent on the perceptions of the specific user, including the extent to which the product supports the user's identity and roles, its ability to make a person independent from others and give control, the goals it symbolizes, the enjoyment it activates, and the memories it triggers [23, 24, 30].

Different factors may influence product attachment at different times. In a study of attachment to cars, researchers found that enjoyment was particularly important for attachment to new products whereas as memories were important for attachment to older products [24]. While attachment tends to decrease after the first year, product attachment is highest for products owned for more than 20 years [23]. If the product is beyond repair, people may continue to hold onto the product if the attachment remains strong. This suggests that product utility is not a necessary condition for product attachment [23]. Each new study reveals a more nuanced understanding of how contextual and product specific features influence product attachment to different products over time. Understanding these relationships can support designers as they create new technologies with increased functionality, usability, and life-span.

Research Methods to Understand Product Attachment

Observation, Interviews, and Surveys
Historically, researchers use traditional design research methods such as observation, interviews, and surveys to understand product attachment to specific technologies [30]. Observations allow researchers to observe behavioral interactions with technologies in context during a discrete period of time. Interviews and surveys allow researchers to ask questions about specific observed interactions and gather additional information about the users and their feelings, values, preferences, and beliefs about the technologies in question [19].

In a study of the relationship between product attachment and personalization for bicycles, researchers approached Dutch students on their university campus and asked them to complete a survey [16]. The survey was concerned with the energy that students invested in altering the appearance of their bicycle, the extent to which their bike expressed who they were, and their attachment to their bicycle. The students rated the extent to which they agreed or disagreed with statements such as "My bicycle fits my identity," (self-expression), "I have devoted much time to altering the appearance of my bicycle" (energy invested), and "I am very attached to my bicycle" (product attachment). This survey-based study revealed that product personalization requires energy investment and informs the degree of self-expression which positively affects product attachment [16]. While such traditional research methods reveal factors that influence product attachment to existing technologies, designers seek new research methods to understand how to use the existing context to inspire and inform the design of new technologies [30].

Research Through Design
When designing new technologies with a product attachment perspective, designers have taken a research through design approach. In this approach, designers observe people in context with working prototypes to understand behavioral interactions and attachments [31]. As an example, Zimmerman and colleagues explored how role identity and control influence product attachment for children and parents when designing a new clock to encourage children to stay in bed until an appropriate wake-up time. While designing prototypes, they learned that parents have a strong attachment to the physical books they read to their children at bedtime and associate book reading with the role of a good parent. They also learned that children have a strong desire for control during bedtime routines. To encourage parent attachment to the clock, they placed the interaction with the clock at the same time as book reading, when parents are most engaged in their "good parent role." To encourage children's attachment to the clock, they designed the clock's wake up music to be programmable by children. By taking a research through design approach, this design team used an existing and specific context to which people were attached to design a new technology.

Role-Playing
While informative and inspiring, the research through design method requires prototyping capability and such capability is not always available at early stages in the design process. When such capability is not available, researchers may rely on role-play to understand product attachment to new, not yet designed technologies. In an attempt to understand emotion and attachment through direct observation, designers simulate an experience such as traveling on a plane and ask informants to hold simple props as substitutes for future tools while spontaneously navigating the travel experience. Informants communicate their needs, emotions, and possible uses for the props as they act [12]. While role-playing reveals ways in which future interactions may be designed, this technique may require extensive resources of time and space. Additionally, the technique requires informants who are willing to engage in extended dramatic performances. Finally, emotions about the context and props are imagined and based on future intentions rather than based on actual experience. As such, the emotions expressed may be less accurate.

While the traditional research methods such as observation, interviews, and surveys, and more experimental methods such as research through design and role-playing, provide ways of gathering information about people's past and future product attachments, the emotional expression is not necessarily directed at the technology with which the person has a "relationship." Such indirect expression potentially reveals less about the character and strength of attachment to a specific product. Further, the current methods ask informants' to calmly rate and reflect on their relationships with certain technologies or encourage controlled experimentation or role-play with new technologies. Given the importance of strongly felt emotions in product attachment, *how might design researchers elicit stronger emotional expression into the*

reflective research task? In an effort to discover new research methods that elicit stronger emotional attachment, let us consider how professional writers capture and communicate strong emotional attachments to technology.

Eliciting Strong Emotional Expression
Understanding that people relate to technology as they relate to people [20], writers write love and hate letters to express their emotions to products, services, and people. The letters are addressed to "entities unlikely to respond" and based on actual experiences with these entities. The letters rely on the traditional structure of a personal letter. Each letter opens with a salutation, presents a thesis about the relationship, defends the thesis throughout the letter, and concludes with new terms of the relationship. In a letter to his SonicCare Electric Toothbrush [29], a writer begins

> *Dear SonicCare Electric Toohbrush, I admit, I was always skeptical of your much-heralded tooth-cleansing prowess.*

The letter continues with evidence that of the toothbrush's limitations. The author concludes with a termination of the relationship.

> *You and your $10 replacement brushes are hereby demoted to electric grout scrubber.*

Just as people communicate strong emotions with each other, this artistic endeavor suggests that people can communicate strong emotions to the technology in their lives. In a letter to Facebook, a writer expresses frustration with Facebook's suggestions to befriend people when she writes [15]

> *Cease your incessant suggestions and leave me to wallow, lonely and in peace.*

The language is not only strong but descriptive. In a letter to his cubicle, a writer expresses anger with himself when questioning his cubicle [7]. He writes,

> *If I hate you so much, why do I spend the waking hours of my prime locked in this terrible relationship?*

With disappointment, the writer allows himself to ask a question as if in a two-way conversation with his cubicle. In a letter to TacoBell CrunchWrap Supreme, a writer expresses love in her letter [18]:

> *I had no idea how deeply I had fallen for you until the terrible day came when you were no longer available. I stood in line, waiting patiently for you like I'd always done. But when I said your name, the cashier responded, callously, "Limited-time item, sorry." My eyes burned like fire sauce as I fought to keep back tears. I didn't even have time to say goodbye!....*

> *Darling, I missed you, and I promise I will never take you for granted again. Please don't ever leave me. I'm nothing without you.*

The letter reveals strong emotion and the details about the context of the relationship.

Because of the familiarity of letter writing as a form of emotional expression, the format is appropriate for revealing product attachment/detachment. *Yet, are all people capable of composing such well-written and emotionally expressive letters to objects unlikely to respond?*

While playful and even tending towards the absurd, these letters reveal through humor and product personification insights about potential product or service improvements. Indeed, design consultancies have recently begun exploring this approach to understand people's emotional relationships to product and services [8]. By asking people to write and recite breakup letters to products and services in an hour plus long workshop, the researchers hoped to understand the emotional connection between people and products; and to differentiate between what they call the "warmer values" and "colder values" of a product (such as "speed, size, and slick styling") [8]. In the workshop, people wrote letters to a variety of services and products such as Starbucks and single cup coffee makers. Participants read the letters out loud to the other conference participants.

This initial recent work suggests that a broader audience is capable of writing emotionally expressive letters and that such letters can express emotional attachment to products and services. Such written expressions, however, ignores the key theoretical insights of Media Richness Theory, which suggest that personal, even face-to-face communications are generally more effective for communication of emotionally laden, equivocal issues than leaner, less rich media such as writing [4]. The myriad visual, vocal, aural, and tactile cues of face-to-face interaction enable this richer communication [4]. Richer communication may reveal greater detail about emotion and product attachment.

To realize the promise of this new method for exploring emotional attachment to products and services, we introduce the Tech Break Up method. The method leads informants to verbalize actual memories of technology love and loss and change, by personifying the technology in the break-up narrative. This brief improvised activity allows informants to describe the most salient factors explaining attachment (and subsequent detachment) to a technology and provides nuanced insights into informants' emotional needs and desires. The brevity of the activity emphasizes the most memorable and meaningful connections in the relationship. Verbal and visual cues in "face-to-face"

communication with the technology emphasize these connections.

TECH BREAK UP METHOD

The Tech Break Up method reveals strong emotional relationships to technology through improvised conversations directly with technology. The method was developed in a study to understand peoples' relationship to technologies that enable creative work and reasons and moments for change in the relationship. The study focused on creative work as researchers find a strong link between creativity and emotion [i.e. 1] and thus people may have strong emotions about technology that supports their creative work. Further, despite the proliferation of technologies to support creative work, few researchers have taken a product attachment perspective in their design and such an approach may reveal new opportunities [21].

In addition to revealing insights for designers, the Tech Break Up method provides psychological benefits for participants. Research in psychology finds that the expression of strong emotions leads to physical and mental health. Interpersonal expression is most effective, however written expression of emotion about past and current traumas is beneficial when interpersonal expression is not viable [25] .

We describe the characteristics and execution, of the method and present observations of product attachment as well as observations about the method more generally.

Recruitment

Fifteen design professionals and students (8 women) were recruited from a Midwestern city to participate in the study. No participants had formal acting experience. Participants were recruited through a snowball technique in which each informant asked a friend to participate in the study after participating in the study.

Process

Upon entry into the research lab, informants were briefed about the purpose of the study – to understand attachments to technology that supports creative work. Following the one-minute brief, they were asked to consider a technology they were no longer using and to think about this technology as if it were a person with whom they had effectively "broken up with." Participants were then given one minute to mentally prepare a "break up letter" including the thoughts they wanted to share directly with the technology. After briefly preparing, the informant sat down in a chair positioned three feet from a video camera, the approximate position in a human-to-human break up conversation. They were asked to address the camera as if it was the technology with whom they were breaking up and told to begin the conversation when they felt ready (see figure 2). Participants took between 5 to 30 seconds to begin.

They were told they would have up to three minutes to communicate their feelings to the technology, however in reality informants were allowed as much time as they needed. A short time limit was set to encourage informants to focus on the key moments of the relationship and to encourage them to stay in character over time. The camera was turned on when they began speaking and turned off when they were finished. Upon completion, participants were asked about their experience preparing and performing the break-up. If alone, the participants were dismissed from the lab. If in the lab with others, with permission they were invited to stay.

Figure 2. Informant performing a Tech Break Up in the laboratory.

Data, Analysis and Documentation

Informants spoke for 30 seconds to 4 minutes resulting in a total of 19 minutes of video recordings. Each recording was separated into clips representing different types of statements, including salutations, reasons for initial relationship, moment of change, reasons for change, and sign-off. Segments that included reasons for initial relationship, moments of change, and reasons for change were summarized and affinity diagrams were created to reveal factors informing technology detachment.

A three-minute video was created to reveal the breakup story arc and highlight examples of participants' performances, however examination of all data was necessary for understanding product attachment to technologies to support creative work.

FINDINGS

People broadly interpreted technology as tools to support behavior. Examples of technologies ranged from non-digital technologies such as Post-it notes and LEGOs to more digital technologies such as iPads (See Figure 1). All technologies were used for more than one year, with the average use length of use being three years. No products were used for 20 years.

Although not instructed to do so, most informants began with a description how the relationship started, how it grew, and why it ended. A design professional spoke directly with her design logbook offering the following explanation:

When we first got together during grad school, I loved spending time with you. I carefully decorated your outside cover with interesting-looking magazine clippings, and lovingly doodled in your margins. I was new to the concept of formalized creativity training, and flush with the promise that something innovative could be born from your blank, white, lineless pages.

Looking back, it's obvious that much of the time I spent with you was wasted. I assumed that the more time I spent sketching and doodling, the more interesting my ideas would become. I didn't yet realize that interacting and collaborating with other humans would get me further than holing myself up in my loft space with you. You became an unhealthy obsession for me.

After school, I dropped you, hard. I guess it was burn-out. I've never really gone back, though someday maybe I will. Don't get me wrong – I think you and I can still have a good thing. Just don't expect my undivided love and attention.

Informants tended to start with what one participant called "the great moments". Leaning into the camera, a design professional explained,

Blog, when we first met…you were always there for me.

The informants regularly addressed the technology by name throughout the break up when emphasizing critical points in the relationship. The language used to describe the relationship resembled language people might use to describe their relationship with other people.

Yet, all language was not based on people to people relationships. A design student happily complimented the technology he used to draw using technology relevant adjectives.

You were simple and useful.

Such adjectives can be directly translated to the design of new technology for creative work.

Looking up as if remembering their moments together with fondness, a design student recalled what the technology, building blocks, in this case, allowed him to do,

I built giant structures with you – mazes, cars.

He concluded with a sigh. These "great moments" were followed by the moment of change, often including a new

recognition. A professional nodded her head signaling her regret as she described her relationship as "unhealthy obsession" and "wasted time." Informants then went on to describe the decline of the relationship, the detachments. A participant looked down, apparently searching for the right words to express his disappointment in the relationship. Another participant raised his voice and pointed his finger at the technology in accusation saying,

You are too over-powerful. You are too overbearing.

The dialogues typically concluded with a story of replacement. With a quiet voice, a professional confessed,

Facebook has kind of replaced you.

The break-ups included both verbal and visual cues of emotional attachments to technologies including sighs and downward glances of disappointment.

The Tech Break Up method case study revealed insights into how people became detached from technology and suggests that the method can be used as an easy and fast way for users to communicate strong emotions around product use and designers and researchers to learn from them. The familiar format of person to person communication supported easy expression of emotion. Dramatic performances were brief and based on familiar rather than imagined relationships.

REASONS FOR DETACHMENT

Like relationships with people, relationships with technologies have a beginning and a build-up period. Over time, these relationships may continue or deteriorate [13]. The study revealed two primary reasons for the deterioration of relationships with technologies: changing self-identity and changing creative process.

Changing Self-Identity

People understood technology as an extension of the self [14]. A professional designer said the following to her blog:

You became my identity. Instead of crying, Blog, I would go to you. I would sit down at the keyboard and I would write it up.

As self-identity changed, informants detached from their technologies. Most informants reported a tipping point. The professional designer described above explained how the blog revealed too much of herself to strangers she did not know, and consequently switched to Facebook as a way of expressing herself exclusively to her friends. A design student described that back when he was "analytical" using grid paper worked well but as his creative identity strengthened, the grid paper began to hold him back. Now, he said,

I want to be intuitive. I want to be creative.

Consistent with past research, product attachment to technologies is informed by the user's identity and roles [23, 24, 30]. As roles creative identity changes, attachment to technology that support creative work may also change. Strong relationships with technology may be most likely to undergo change during professional development when identity is actively being formed. To encourage product attachment, designers may consider how new technologies are introduced during times of professional transformation.

Changing Creative Process

In addition to changing identity, creative process also changed people's relationships to technology. People detached from technology due to changes in their creative process such as increased collaboration with others, increased standards of performance, and the desire to do less commercial work.

A professional designer broke up with her logbook when she realized that her intimate relationship with the product was limiting her creative ability. She was interested in involving more people in her creative process. With frustration and disappointment, she confessed to her logbook.

> *I didn't yet realize that interacting and collaborating with other humans would get me further than holing myself up in my loft space with you.*

A design student increased his standards of performance after gaining experience in a summer internship. He complained to his Post-it notes, saying,

> *I think quality matters. I'm no longer satisfied with one-liners.*

He acknowledged his change of standards and the technology's limitation in meeting his standards as a reason for ending the relationship.

As one of the professional designers became less interested in doing creative commercial work, her relationship with her technology changed. She describes the influence of external factors on the relationship saying,

> *The whole commercialization of you, Blog. It started kinda [sic] killing my creativity.*

Consistent with past research, product attachment is supported by the goals the technology symbolizes [23, 24, 30]. Over time, the goals of the technology and the goals of the users became misaligned. Just as people's goals may diverge in person-to-person relationships, so might they diverge in technology-to-person relationships. When designing new open-source technologies online, designers may consider how the need to commercialize such products to earn a profit may change early adopters attachment to the technologies.

Changing ability

In addition to changing creativity identity and process, informants described how they became detached from technology as their abilities changed and the utility of the product remained the same. A design student says that he no longer plays around with children's building toys because he is able and wanting to "design real things now."

When breaking up with his iPad, a design professional accused the technology of being designed to limit the user's control and thus the utility of the technology:

> *You want to be in control of everything.*

As his programming skills increased, he wanted to use the technology in a new way. At the conclusion of his break up, he tells his iPad that it will be given to his 5-year-old daughter. Consistent with existing research, the ability to make a person independent from others and give control is a reason for product attachment [23, 24, 30]. This finding suggests that taking away control may be a reason for product detachment. When designing new technologies for creative work, designers may consider how technologies can be changed or upgraded to meet the users' changing ability. Game designers who scaffold increasing levels of difficulty into the games they design understand the importance of designing for increasing skill ability [9].

EXPLAINING DETACHMENT

Women tended to reveal the technology replacement with guilt whereas men tended to be confident in their replacement. Women blamed themselves when breaking up, explaining, "It's not you, it's me," and, "You were everything to me." Men tended to place blame on the technology explaining, "You are too overpowering, too overbearing," and "You're not enough." Such gender differences reflect orientations toward conflict and emotional endings. Designers may consider such explanations when designing tutorials to support new technologies when users may feel vulnerable or angry with a product.

PROMISES OF THE TECH BREAK UPS METHOD

Tech Break Ups elicited confessions of strong emotional attachments that people once had to technologies. The early research method compelled informants to briefly reflect on and communicate the high and low points of their past relationships with technology and tipping points for terminating the relationship. Informants presented strong emotions about particular features of the technologies. At the same time that it provided useful data, expectations of participants is minimal compared to other experimental methods and the procedure was a satisfying experience for the participants.

Further, preparation time was intentionally brief so as to encourage informants to remember the most emotionally salient events. In pilot testing, we learned that when given

more time, informants expended effort on the witty expression of emotion and were more concerned about their ability to "act" well. The brief time appeared to encourage greater expression of raw emotion.

Participant experience
Participants devoted minimal time (less than 5 minutes total) in the study and therefore expectations for compensation were minimal and significant less than what might be required of using the other research methods describes such as interviews or research through design. Because of the short duration of the task, recruiting participants with high levels of commitment and interest in the project was not necessary as it is for other user research techniques that require at least one hour of commitment. If design research techniques have wide spread appeal, the diversity of participants increases. A technique that requires creative writing skills such as composing break up letters [8], may eliminate participation. While I anticipated video recording might inhibit participation, only one person declined participation due to discomfort improvising while being filmed. Watching others complete the task built comfort for the more shy participants. Further the short, improvised duration of the conversation normalized pauses and discomforts associated with breaking up.

Although design research methods tend to focus on the quality of the data and efficiency with which the data is retrieved, the Tech Break Up method highlights the possibility of designing enjoyable research practices for informants. All of the informants described their satisfaction at the conclusion of the procedure. This is consistent with psychologists' finding that emotional expression promotes psychological well-being [25]. A professional designer described the experience as "cathartic," another shared the following with the experimenter:

> *I didn't realize how attached I still was. What a relief to formalize the break-up.*

The research method also stimulated thoughts about other products and services with which informants had "broken up," revealing to them the transitory nature of their relationship with technology. A student designer shared the following reflection with the experimenter the next day:

> *I never thought of breaking up. It was thought provoking. I talked to my roommate after about breaking up with toys and how you want to be careful about who to give them to because they still mean something to you even though you no longer play with them.*

Finally, while some participants chose to sit alone in the lab when breaking-up with their technology, others felt comfortable having peers in the room to observe during recording. All participants were eager to see the recordings of other people's break-ups upon completion. Perhaps the voyeuristic nature of overhearing a break up enhanced the satisfaction with the method.

Because the language and structure of person-to-person break-ups are familiar, participants were able to role-play easily without extensive preparation. Further, they could express strong emotions with less inhibition because of the short improvised format.

DISCUSSION
Objects have been described as "props" that support people's presentation of self [10], as a companion to help people think [26], and helping to achieve life goals [3]. Similarly, this study found that detachment to technology was often the result of changing self-identity, creative process, and ability. The findings reinforce the way in which we conceive of technology as part of the self. And yet, as the self changes, so must the technologies associated with past creations of self.

Viewing relationships with technology as we view people-to-people relationships may further inspire and inform the design of new technologies. This perspective may be increasingly important for designers as utility and ease of use become standard features of design and emotional connection with technology in our professional and personal lives is increasingly desired. Additionally as the population and consumption of technology increases, understanding ways to expand product lifespan is increasingly important. As such, we need research methods that help to inform and extend these relationships. This work is an attempt to meet the growing demand among designers and the consumers for whom they design.

FUTURE WORK
This study suggests future investigation into new methods for understanding product attachment. Given that people interact with technology as they interact with people [20], we intend to explore other popular communication media such as telephoning, emailing, and texting. While these media are less rich mediums, they allow for inclusion of a larger population. The use of such media are also consistent with growing efforts to conduct research and engage the "crowd" in creative work [6]. Further we intend to compare Tech Break-Ups directly with written love letters and interviews to understand the differences in the quality of information gathered and experience of the participants. We also intend to consider the role of emotional intelligence, the set of skills hypothesized to contribute to accurate appraisal and expression of emotion in oneself and others and regulation and use of emotion to plan and motivate [22], as well as reasons for participation in the research method. While researchers have emphasized the functionality, ease, and usefulness of research methods for researchers, few have considered the experience of the

participant. As companies increasingly rely on user involvement in product development process, it is important to design research methods that users enjoy [28].

Finally, future work may investigate the role of culture on research methods that reveal emotional attachment. While self-disclosure is increasingly normative in the United States, such methods may need to be modified for cultures that do not support such self-disclosure.

CONCLUSION
Increasingly, we are interested in designing technologies that are not only functional and easy to use, but also emotionally engaging. Thus, we eagerly search for new ways to understand the people for whom we design and the way in which they are emotionally connected. We can review behavioral theory and conduct field work to gain a grounded and empathetic perspective on the use, yet new methods are needed to reveal new insights [30].

The Tech Break Up method quickly and relatively easily provided grounded insights to inform the design of new technology that supported creative work while simultaneously providing informants with an immediate positive emotional experience.

ACKNOWLEDGMENTS

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