How Deep Is Your Love: *Deep Narratives of Ensoulment and Heirloom Status*

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This paper describes our ongoing research about what it takes to design things that can be ensouled or can achieve heirloom status as a matter related to sustainable design. This paper draws on research on fifteen *deep narratives* that we collected to uncover detailed accounts of relationships between each participant and a single particular loved artifact or collection of a single type. Three themes emerged from our analysis of the narratives: (i) intimacy accumulated as an association with an object over time, (ii) investment of effort to learn and control functionality, and (iii) implicit values related to the patterns of collection of artifacts. In conceptualizing these three themes as an analytical frame, we arrived at two unifying notions that generally apply across many of the narratives and that serve as catalysts to design principles, namely the notion of *rarity of an object*, and the notion of *aficionado-appeal of an object*. We conclude by considering how these unifying notions can be used reflectively and judiciously to prompt design principles for interaction designers at least, and possibly as design principles *in-and-of-themselves*.

Keywords – Deep Narratives, Design, Ensoulment, Heirloom Status, Personal Inventories, Sustainability.

Relevance to Design Practice – This study describes fifteen deep narratives on the relationships between individual people and their particular loved objects. Based on the analysis of the narratives, we suggest practical design principles that designers can use to create ensouled and therefore sustainable designs and systems.

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Introduction

One of our ongoing research agenda in sustainable interaction design is the exploration of why people keep and care about some things and not others as an issue of sustainable practices to inform the design of interactive digital things. This study introduces a method we call *deep narratives*, which is targeted as a means to understand particular relationships between people and particular things at a deeply reflective level. This method is a complement to other existing methods—including *ethnographies, surveys*, and *personal narratives*. However, the method of deep narratives is not itself the main contribution of our work. Rather, the search for principles of sustainability as a driver of interaction design—specifically, the search for the links from particular and rich stories of things to meaningful design implications for creating ensouled, heirloom status objects—is the contribution of this study.

The core idea of *deep narratives* is the deep examination of very specific possessions that study participants indicate are deeply loved, rather than whole collections of possessions as it has been done in previous studies with *personal inventories* (Blevis & Stolterman, 2007; Odom, Pierce, Blevis, & Stolterman, 2009), socio-psychological approaches (Csíkszentmihályi & Rochberg-Halton, 1981), or socio-cultural approaches (Belk, 1995; McCracken, 1988). By the notion of *deep love*, we mean simply and somewhat metaphorically to describe and name whatever it is that motivates lasting relationships between people and things. Our goal is to reflect on these very specific instances in order to postulate—without hoping to prove for a general case—design principles that may promote more sustainable behaviors with respect to owned things.

Prior Research and Related Literature

The notion of *ensoulment* and *heirloom status* has been discussed by Blevis (2007) as an issue of sustainability with respect to design of interactive digital technologies. That study reported on survey research and introduced the notion of *personal inventories* conducted in people's homes to uncover why some things are cherished and others are easily discarded. Since then work has continued in the area of digital artifacts through a process of collecting additional personal inventories and surveying people's attitudes regarding the ways they own, preserve or discard their digital artifacts or theoretical reflection on loved things—either physical or digital—with more focus on the qualities of objects being cherished (Hanks, Odom, Roedl, & Blevis, 2008; Odom, Pierce, Blevis, & Stolterman, 2009). In addition to such previous

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work on the relationship between human and objects in the context of sustainable interaction design, the present study is also informed by an artifact-centered, interpretive approach to the study of artifacts with the purpose of exploring how material reality is understood and experienced in people's subjective consciousness (Bardzell et al., 2009) as well as how artifacts influence the way people shape their personal and social life (Forlizzi, 2008; Jung, Stolterman, & Ryan, 2008). Such approaches provide new insights in to the durable human-object relationships from broader cultural and socio-technological contexts. Our research demonstrates a closerelevance with the work of others, especially Borgmann (1984), McCracken (1988), Csíkszentmihályi and Rochberg-Halton (1981), Miller (1998), and Verbeek (2005). In this article, we summarize what we have learned based on our prior work and available literature to illustrate the relationship between people and things; we then present the next stage of our work using *the deep narratives* method.

Two possible ways in which the study of artifacts could be theorized are: 1) *material ecology*, as in Nardi and O'Day (1999) and Krippendorff (2006), and 2) *material culture*, as in Miller (1998), Attfield (2001), and Woodward (2007). The former emphasizes the extent to which an artifact participates in a system of artifacts, and the latter emphasizes the role of artifacts in human meaning making and activities. Following the research tradition of material culture, our proposed style of developing understandings by means of deep narratives has parallels to other contemporary approaches such as those represented by the accounts in Pearce's edited volume, *Interpreting objects and collections* (1994), Turkle's edited anthology, *Evocative objects: Things we think with* (2007)—the title itself appears as complementary and reactive to the naming of the MIT *Things that think* Consortium—or such as those represented by the object accounts in Glenn & Hayes *Taking things seriously: 75 objects with unexpected significance* (2007), as well as Daniel Miller's *The comfort of things* (2008). This body of research is hermeneutic in orientation; considering ways that artifacts are implicated in human understanding and meaningful interpretation and stressing that the use, display, and ownership of individual artifacts cannot be understood in isolation from context and environment. Our objective is not strictly to add to a corpus of ethnographic scholarship or to more general accounts and community discussions of popular culture, but rather a more practical account which is to create bridges between deep understandings of the relationships between people and loved things and design practices that promote sustainable behaviors. Specifically, our intention is to elaborate diverse manifestations of attachment that a person feels to his/her particular object by investigating different motivations for attachment. At the same time, we explore whether such motivations and patterns of attachment actually result in durable relationship between human and object and if not, how we could achieve such status in the context of interaction design.

In discussing notions of *ensoulment* and *heirloom status*—as a factor that induces sustainable relationships between people and objects, it is also important to note that there are many ways to think about how and why people become attached to some things and not to others. There are many approaches informed philosophically or ethnographically, for example, self-documentation (Ahde, 2007), surveys (Schifferstein & Zwartkruis-Pelgrim, 2008), design critiques (Mugge, Schoormans, & Schifferstein, 2005), and theoretical reflections (Russo & Hekkert, 2007). These approaches have illustrated diverse phenomenon of human-object attachment as manifestation of social symbols, economic values, personal memories, or self-identities through an object. In this paper our understandings regarding the qualities of cherished objects in general is based on one conceptual foundation—the distinction between *intrinsic value* of something and *subjective meaning* of something.

Nozick (1989) posits that, "Something has intrinsic value to the degree that it is organically unified. Its organic unity is its value" (p. 164). The intrinsic value is one reason we appreciate a specific object or design, even though we might not like what the object or design stands for, or how it is used. It might, for instance, be possible to appreciate the intrinsic value of a cathedral, such as its architectural qualities, even if you have problems accepting the religious aspects of the building and its symbolic meaning. The intrinsic value is what is focused on in an art appreciation class, or a literature class, or during wine tasting, etc. By being exposed to different aspects of the object, for example, its structure, form, material, texture, smell, taste, etc., we learn to see and appreciate the intrinsic value of the design itself. Collectors of something are typically skilled at discerning and appreciating subtleties of the intrinsic value of a particular design. According to Nozick, a design has *meaning* when a person understands or

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constructs how it is related and connected to other things that are valued. Meaning is in Nozick's philosophy a relational concept. An object can have a lot of meaning to a person even though its intrinsic value is low and non-existing. A kid's drawing and a wedding picture are typical objects, which by most would be seen as having low intrinsic value but of course can have a lot of meaning. Nozick makes the case that meaning as relationship points from one object to something else we value in it, so the meaning of the kid's drawing reminds the owner of the child. This leads to a situation where *value* and *meaning* have an intricate relationship. The meaning of an object can only be ascertained by linking it with something of value, and something of value can gain meaning by being linked to something else of value. What really makes the difference is the nature of the linkage. Nozick makes the case that this relational approach to meaning and value is a both philosophically sound and useful as a practical analytical tool when it comes to the complexity of how people relate to their things.

In many of the narratives that follow, we found this intricacy of value and meaning. Some of the narratives are clearly about objects with a high degree of intrinsic value while others can be understood as carriers of meaning since they connect the owner to something else that, for the owner, is highly valuable—for instance, the memory of a particular person, place, or activity. The conceptualization of the link between intrinsic values and meanings of an object guided our analysis of the narratives by considering ensoulment or heirloom status as dynamic interactions between a person and a particular thing.

Deep Narrative as a Method and its Limitations

Deep narratives as a research method is an appropriation of several existing methods, including the notion of *personal inventories* (Blevis, 2007), the ethnographic notion of *personal narratives* as in Langellier (1989), Tedlock (1991), and Maynes (2008), and collecting inventories as a common methodology in oral and practice traditions of design. Our purpose is not to conflate these methods together needlessly, but rather to use all means available to arrive at a notion of practical design principles that designers can use to create ensouled and therefore sustainable designs and systems in a way of theorizing human-object relationships.

In theorizing objects, Harré proposes five principles that are illustrative of how the significance of objects is rendered visible through narratives. Chief among them, and in concert with the notions from Nozick, are the following two principles: "Material things can serve as carriers of meaning, for the moment and in the context of a story," and "material things may be potent in a special way in the context of the story" (Harré (2002) as cited in Woodward (2009)). Accordingly, *apropos* of the use of deep narratives as a means to generate design principles in the context of sustainable interaction design, we ascribed the following uptakes, which although subtle are important to the spirit of our inquiry:

- *Beyond the observable*: Attachment to an object is very personal and subjective. We tried to place more focus on the participant's perspectives and self-described values in her or his own voice rather than on the investigators' observation. In addition, we looked for any underlying patterns of attachment from these subjective accounts.
- *De-familiarization* (Bell, 2005): Sometimes people cannot articulate why they like certain things. While attempting to articulate why and how they care about certain things, individuals may talk about relevant stories and meanings or values, in a way that may not have occurred to them before the exercise of articulation.
- *The context of an ensouled thing*: In many cases, ensoulment or attachment to something is related to the context of life stories associated with other people, things, or events. We looked for holistic systems of meanings apropos of things described by the participants that have been built up over time.

Beginning in May 2009, we started to conduct deep narrative interviews as a continuation of our studies about the relationships between people and things. The goal was to elicit accounts of personal experiences with artifacts with the idea that (i) histories of objects and life stories of people are inseparable and that (ii) these personal possessions are imbued with meanings because they are embedded in people's lives and memories and because they are representations and extensions of selfhood, as described in Belk (1988) and Bourdieu (1987), for example. We entered into conversational interactions with our participants, and by means of dialogs and story telling, we were able to explore how people fashion their identities through their interactions with cherished artifacts. At the same time, we sought to investigate how people perceive either aesthetic or functional qualities of their cherished artifacts, that is, the artifact's intrinsic qualities in relation to its subjective significance, as well as their efforts to appreciate such qualities of their special interest. As of this writing, 15 narrative accounts have been collected, with participants from three different countries (i.e., China, South Korea, USA), with an age span of 20 to 60 years, and an almost even split between male (8) and female (7) participants. Narratives were collected from individual interviews, each taking about 90–120 minutes, either by instant messenger (using video conferencing tools) or in person. Participants were mostly recruited from the acquaintances of the researchers. These established relationships indicate that the interviews would be conducted in a context of trusting relationships between participants and interviewers. Follow-up questions regarding specific aspects of the stories were asked during or promptly after the initial deep narrative interviews. We did not specify particular criteria for participant recruitment, nor did we impose any rules on how participants should select an object for discussion. We primarily considered whether participants have any stories that they are willing to share about any objects that they regard as important in their lives. Additionally, we did not pre-define attachment as a particular type of relationship between person and object. Instead, we sought to investigate what it means when a person feels attached to her/his selected

object, and why and how such sentiment is revealed through story telling. In subsequent data analysis, we focused on thorough analysis of individual narratives and identified higher level of connections between emotional ties to things and implications for interaction design, as opposed to comparing the findings from the narratives to participants' demographic information as done by Csíkszentmihályi and Rochberg-Halton (Csíkszentmihályi & Rochberg-Halton, 1981).

In the study, we asked our participants to share with us what they considered to be their most cherished objects. We noted the locations of these objects, in relation to other artifacts surrounding them, and we probed to understand the histories and meanings behind these precious artifacts. Pictures were taken to capture our participants' material possessions for analysis. We conversed with our participants about memorable events surrounding these artifacts, centering on two primary directions:

- *Transcendence:* How do these inanimate objects transcend the qualities intrinsic to their materiality and functionality to forge social relationships and reveal the passage of time in people's lives?
- *History:* How are these artifacts themselves imbued with histories, whose meanings evolve over time, deeply embedded in their owners' lives? And how do these changes in meanings influence the use and perception of artifacts?

Participants described how they acquired and used these objects, the factors (e.g., cultural practices, religious beliefs, family traditions, etc.) that influenced how they displayed these objects, what they described as the characteristics of the objects (e.g., material, construction, function, and design, etc.), as well as how they preserved them. We explored with our participants the emotional experiences associated with these artifacts by pursuing the ways in which participants express the significance of, as well as their interaction and engagement with, these artifacts.

We analyzed each narrative in depth with a focus on differing motivations and effects of attachment. We then investigated underlying patterns revealed across different phases of attachment to various types of objects based on Nozick's notion of intrinsic values and subjective meanings of objects as described above. The process of analysis and reflection will be described later.

Summaries of the Deep Narratives

The deep narratives that we have collected are intended to be the opposite of general examples or universals. Rather, we think of these narratives as instances of *ultimate particular* things (Nelson & Stolterman, 2002). They are *tableaux* for reflection and reasoning from the ultimate particular about possible, more general design principles. They are not ethnography *per se* either, but rather intended to yield a reflective frame that may be applied to other ultimate particular situations in order to actually change the way things—digital things—are designed in relation to their sustainable potentials.

Overview

We assumed that everyone may have favorite objects in her or his life, thus, we did not consider specific criteria, such as if an object has been used for long time or if an object has particular appeal to a certain group of people with unusual interests in selecting narratives (as in Huh (2010), Rosner (2009)). Instead, we wanted to know if we could see different aspects of attachment—different motivations for or kinds of ensoulment or heirloom status in each narrative. There were a few respondents who considered the concept of "attachment to" or "caring about things" too ambiguous since we intentionally did not specify these concepts—that is, these few said that they didn't care about anything very deeply. In these cases, we used such indications as an exclusion criterion and did not include such respondents in our data. In addition, considering "attachment" as very subjective relationship, we did not intend to quantify or measure its extent. The included participants' subjective interpretations of "attachment" enriched our perspective and understanding of the relationship between people and objects.

The types of objects discussed by our participants included: a sketchbook, a desk, a music collection, books, dinnerware, a cardigan sweater, jewelry, cameras, computers, hard drives, a Play Station Portable (PSP), a portable music/media player, an audio player, and musical instruments (a cello and a trumpet). The stories embedded with objects in the narratives cover a variety of topics ranging from such attributes as functionality, usefulness, aesthetics, material qualities, or economic values to attributes such as personal interest, self identity, memories of others, history or intimacy. In many cases, more than one topic is related to each narrative.

In what follows, we describe each narrative briefly (with a focus on how participants identify their favorite objects and what meaning they have) and discuss emerging themes more in depth in the next section to draw out meaningful design implications. We have assigned each person with a descriptive keyword(s) as a way to make it easier to document each narrative. We have also assigned fictitious names rather than using actual names to protect the anonymity of our participants. Figures 1-5 show some of the objects the participants identified as cherished objects.

Optimization: Joon's Play Station Portable (PSP) (Male in 20s)

Joon uses his PSP for watching movies or playing games on the move. It is his second PSP—he had obtained his first one brand new three years ago, but sold it after a while disappointed with software limitations. Two years later, he found out how to customize the device firmware to use a variety of software, and bought his present version of the same model he had purchased new before second hand.

Serious Amateurism: Ben's Cameras (Male in 50s)

Ben has been learning photography for almost 20 years. Starting with a Nikon F80 at first, he has used four different camera models from three manufacturers, namely Pentax, SONY, and Nikon.

Recently he mainly uses a Nikon F700, but still keeps all the other cameras. The more experience and knowledge he develops, the more things he perceives he needs: different types of lenses, bodies, tripods, etc.

Figure 1. Joon's Play Station Portable and its worn-out surface (printed with permission by study participant).

Early Adopter: Kevin's Digital Devices (Male in 30s)

Kevin likes to learn about computers and digital devices in general. He occasionally buys new digital devices ranging from music players to computers, and sells used his devices to obtain the most-recent devices. He does not keep one thing for a long time, but takes care of it while using it by regularly cleaning the inside as well as outside; it can be considered personal hobby of his.

Daily Routine: Tan's Portable Media Player (PMP) (Male in 40s)

Tan received his PMP two years ago, giving his old portable music player to his sister. With his PMP, he can "kill boring time" when walking to work or traveling by car. He finds it cumbersome to translate media file formats to save in PMP formats, and he would obtain a new one if it could solve this problem. If he does so, he may give his present PMP to his sister again.

Collection as Hobby: John's Music (Male in 20s)

John has collected roughly 200 vinyl albums of his personal interest. He likes to find new music and to have music he loves at his disposal. The physical artifact (vinyl record), the music (commodity produced), and the processes of acquisition (finding a record) and consumption (taking the record out of the sleeve and playing it) are all significant to him. Recently, he finds that the artifact and the process of acquisition appear less significant for CDs or MP3s.

Collection & Self-Development: Jina's Books (Female in 20s)

Jina has some books that she carries around whenever she moves to different places, although she rarely reads them anymore. Examples include her first English dictionary, a fiction novel *100 hundred years of solitude,* and an essay in Korean. She is strongly attached to her stories of these books and considers them as her "life model." Sometimes, she gives her own books away to others, particularly ones she herself found to be inspiring.

Collection & Self-Expression: Yoon's Cashmere Cardigan (Female in 30s)

Yoon cares about her cashmere cardigan so much that she rarely wears it except for special occasions. It was her first item of expensive clothing, a university graduation gift from her mother. In general, she is very interested in fashion and style. Sometimes she obsessively purchases clothes, but never does so impulsively since she always thinks carefully about what she needs and what fits her well.

Figure 2. Yoon's collection of clothes and Cashmere cardigan (printed with permission by study participant).

Exotic Taste: Feng's Japanese Dinnerware (Female in 30s)

Feng is enthusiastic about a set of Japanese dinnerware. She likes its exotic design with cherry blossom patterns and pottery textures. She viewed a whole set first in the local shop, but obtained used dinner plates later from postings on *Craig's-list*. She wants to collect more pieces of the series—rice bowls, teapots, etc. She is very careful with them, so as not to scratch them.

Traces of Computer Activities: Zhou's Hard Drives (Male in 20s)

Zhou has collected his data from computer work almost for 14 years. It is his routine to regularly backup all the data on hard drives before his computer becomes full. He claims to have more than 3000 gigabytes (GB) of data! Saying that he keeps an index of the whole data archive in his mind, he dislikes auto-synchronization features among devices, which mixes up his way of managing files.

Memory Weaved into Practicality: Susan's Laptop (Male in 20s)

Susan considers her laptop as her most important object. In describing her laptop, Susan mostly emphasized functionality, but also had a pleasant memory about the time she first received this laptop. It was a present from her now ex-boyfriend roughly one year ago. He first introduced her to Apple computers and taught her about all of the new features of the computer, prior to their breakup. Still, the memory of the context under which she first acquired and used this laptop is a part of the meaning she ascribes to it and a cause for the importance she attaches to it.

Family History & Reconfiguration: Young's Audio Player (Female in 30s)

Young's father enjoyed and held a deep knowledge of music. Young had presented a high quality audio player to her father with money from her first paycheck ever. They picked up the player together at the store. After her father passed away, she took the player to her house. She has recently added new high quality speaker cable and new speakers. She hopes to continue use this audio player for her entire life.

Figure 3. Young's old audio player and new speakers
(printed with permission by study participant).

Family History: Jane's Heirloom Desk (Female in 60s)

Jane described to us her "grandpa's desk"—a term originally used to describe the desk to her children. This is an old desk previously owned by her grandmother and still in use. It is her most cherished possession. Her mother (not her father, as her naming would suggest) bought it new in the 50's. She was thrilled to have inherited it: She had always loved it and wanted it since a young child.

One-of-kind: Chong's Painting & Sketchbook (Female in 40s)

Chong has a cherished sketchbook containing years of sketches she created as a student of Architecture. She also has a calligraphic Chinese painting, which has much meaning for her because it was painted specifically for her by a Buddhist friend. She placed so much emphasis on the value of these two things because they embodied artwork she herself had created, in the case of the sketchbook, and artwork done by a friend, in the case of the painting.

Figure 4. Chong's painting and sketchbook
(printed with permission by study participant).

Intimacy & Control: Devin's Cello (Male in 30s)

Devin has learned cello since he was eight years old, and he majored in cello performance as an undergraduate. He has been using his present cello for 15 years. This is his third Cello, and it was originally made in 1984. He has practiced music with this cello almost everyday—no matter where travels have taken him. After 15 years of practice, he thinks that they (he and his cello) know each other in an almost human sense of a close relationship.

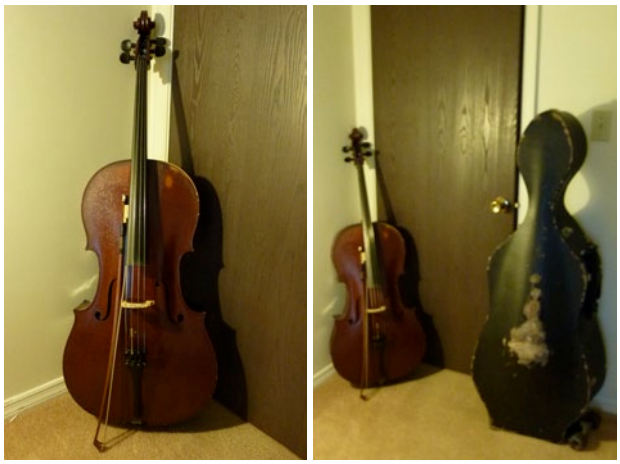

Figure 5. Devin's cello and its worn-out case
(printed with permission by study participant).

Learning & Self-Development: Eugene's Trumpet (Male in 30s)

Eugene has been learning to play trumpet for six months. He feels very motivated to learn a wind instrument for the first time in his life. It reminds him of his childhood when he learned to do something new. He cleans the trumpet very carefully and often calls his teacher to ask about how to take care of it.

Issues Revealed in the Deep Narratives

We analyzed and reflected on each narrative in depth with a focus on differing reasons for attachment to and caring about things. Specifically, we analyzed each narrative by listing up all the events occurred to the objects—including how the objects were obtained or used and how life stories or other objects came in between the corresponding objects and the owners. Then we looked into the specific events across all the narratives to find any recurring issues in the procedures of building attachment. After that, we categorized similar issues and reflected on the narratives again by using those issues as an analytic framework. In this course, we consolidated the common issues into critical themes for meaningful human-object relationships by applying theoretical concepts from material culture and sociology to explicate those issues. Not all of the narratives collected are about things that have achieved deep ensoulment or heirloom status over a long period of time. Some of the treasured things were frequently acquired, short-term things—for example, Kevin's early adopter patterns with digital devices. Kevin's intensive interest in digital devices creates a never-ending desire to always acquire something new. Thus, stated attachment to an object is not a guarantee of a durable relationship with that object. Some other narratives concerned emphasis with the materiality, perceived luxury, and high status

of particular material things with unique design and expensive economic value—for example, Yoon's valuation of her cardigan sweater. However, although the case of the sweater indicated a long lasting relationship, her attachment to the sweater did not keep her from collecting other items. Likewise, all the stories have unique messages in terms of their underlying motivations and attachment effects for different phases of human-object relationship. These findings lead us to understand different sentiments associated with product attachment, such as enchantment by style, appreciation of functional or economic values, recollection of personal memories, or even painful effort for mastery through an object. Here, attachment is caused by varying motivations and manifested in different ways, not necessarily resulting in love *per se* as in the sense of constant excitement or enchantment, but also in terms of dedication, preservation, adaptability, and so on and so forth. In the following analysis, we investigate some of these different aspects of attachment (as underlying reasons for product attachment) and their implications for sustainable interaction design (in terms of how to link such feelings to durable human-object relationships).

On reflection, we summarized the issues emerging from the narratives in terms of three specific themes regarding different motivations for attachment, namely (i) *intimacy accumulated* as an association with an object over time, (ii) *investment of effort* to control functionality, and (iii) *implicit values* related to the patterns of collection of things. These three themes are not the only possible emergent issues from the narratives, but they are the issues we choose as the scope of our analysis as presented in this particular article. Also, the narratives are not uniquely classified according to only one of these three themes; rather these themes constitute a reflective frame for understanding the narratives at hand. All these themes are related to each other in a broader context of material culture by representing different aspects of engagement with an object to create meaning to intrinsic value of a certain object. Based on the reflection of these three themes, we could see common properties of objects that contributed to different phases of attachment, which will be discussed in detail later as catalysts to design principles. In addition, we will also highlight some noticeable comparisons between physical and digital artifacts regarding the processes of building up attachment with these different types of materials.

Issue 1: Intimacy Built over Time

Time is an important factor in the evolving relationship between person and object (Karapanos, Zimmerman, & Forlizzi, 2009; Pace, Bardzell, & Bardzell, 2010). The meaning of an object is built up over time as it is related to memories of loved ones, or active and/or frequent interactions. Memories of others or special occasions are critical for things to become ensouled and preserved as heirloom status as in the stories of the audio player and the desk. However, such a relationship is largely dependent on a person's subjective experience, and thus specifying a designer's role in this process still remains a challenge (Battarbee & Mattelmaki, 2003; Bell, 2005). Here we focus more on the stories involving dynamics between human object–conditioning and meaning-making with respect to particular objects. An illustrative example of this is the cello, with which repetitive use for practice and learning effects an intimate memorable relationship. Familiarity through repeated use or as a repeated association with a particular memory as in the case of Susan's laptop or Young's audio player can lead to an ensouled or heirloom status relationship. Over time such an object can become ensouled, and it possibly cannot be discarded or replaced with another things, no matter how similar. Notions of *intimacy through repeated use or association* leading to attachment relate to Verbeek's concept of *engaging devices,* which refers to products that require deep human involvement with the object as a *material thing* as opposed to products whose "machinery withdraws so that only their functionality appears in the foreground." (Verbeek, 2005) A similar account can be found in the philosophy of Borgmann—in his concept of "things" compared to "devices." According to Borgmann, *a device* presents its user with a commodity without any or minimal interaction, while *a thing* requires a user's attention and care over time with the potential to create meaning and engagement (Borgmann, 1984), like the case of the cello.

In Devin's narrative, we were told that he has used the cello for more than 10 years. The way he takes care of this particular cello has changed along with the way he plays the cello. At first, he was very careful to meticulously maintain the cello in order to create the perfect sound, for example, by exchanging his strings or rehairing his bows regularly. However, after seven years of daily practices lasting hours, he now believes that the sound depends more on himself and his playing technique then on frequent and overly meticulous use of additional materials. He describes the periods of his practice as even being painful, but now feels even more comfortable with his cello after repeating such painful practice. Devin and the cello have come to know each other better in an almost human sense, as he described: "every cello has different voices at first, but it gets its personality while being played with me. This cello cannot be replaced with any other cello." That is, we may say that Devin relates to his cello as to what Don Ihde refers to as a *quasi-other*—something present to us almost but not fully as human (Ihde, 1990). In another sense, the cello was ascribed with a unique value, which is inseparable from its substantive and material existence, through the dynamic interaction with its owner. This particular associative value is also in accordance with Kopytoff's notion of *the cultural biography of things*—the chain of events through which an object becomes culturally marked and unmarked as a particular type of thing (as referred in Appadurai, 1994).

Issue 2: Effort to Control Functionality

In addition to personal history that had accumulated over time, functionality also can be a motivation for attachment as an intrinsic value of an object. Particularly for digital devices, many are interested in new technologies and find specific needs based on their knowledge; the more they learn, the more specific their needs become. Even though some people may become really attached to certain things in this way, it may be seen as temporary compared to what we mean by ensoulment or heirloom status (because an object is easily exchanged for another object with improved functionality). However, an object valued for its functionality may become an ensouled object if its function makes it valued in

context of memories and history—associated with investment of time and effort to search for knowledge on its function—even in the presence of newer, better things. It may also be ensouled if it participates as uniquely good for a particular function within the context of a personal product ecology.

For example, Joon—the PSP owner—states that his current PSP is the second object of this same model that he has owned, as we have already noted. He purchased his first PSP three years ago, soon after the device was made commercially available, as he is very fond of gaming. However, he became disappointed with the first PSP he purchased when he discovered numerous limitations in using different software programs with the device owing to its pre-installed firmware. When he purchased the device originally, he was not aware that he would not be able to watch movies or run other software except for games. He had hoped that he would be able to use the PSP to watch movies as well, for example, because of the high quality display. He sold the original PSP and purchased a more versatile device. After 2 years, he learned that he could install customized firmware on a PSP, which would allow him to install different software like a movie player. On learning this, he purchased a second-hand PSP, the exactly same model that he had purchased and sold two years earlier and installed the firmware to make it suitable for his needs. Moreover, Joon has been interested in digital entertainment devices in general for a long time and has a commanding knowledge of features, performance, and prices among similar devices. He has two other important devices in addition to his PSP—an *iPod Touch* and a mobile phone, whose functions are largely redundant one-to-another as devices capable of playing videos or music. However, Joon is really keen in his description of the strength of each device. The *iPod Touch* is good for file management, while the mobile phone's digital media broad casting (DMB) service allows him to watch sports games that interest him, and the PSP has a relatively large and high quality display better suited to watching movies. Joon further indicated that he is very satisfied with the current configuration of different portable devices that he has come up with through several years of trial and error with his personal collection of devices and by means of product reviews on the web. The narratives of the cameras and the computers afford similar stories of attachment starting from interest in practical functionality and leading to more knowledge about the details of competing devices and their configurability by active learning.

Issue 3: Implicit Values of Collection

While people actively replace things to satisfy their specific functional needs, especially for digital things, others tend to make collections of particular categories of things. Some of the narratives—as in the case of the cardigan, the books, the dinnerware, and the music—illustrate that people can care about something in a collection and preserve it although they do not use it practically or frequently. In our narratives, some participants collected items without a present use but did not discard them because of the possibility of a future use or other implicit values, which is also related to the concept of *perceived durability* mentioned in Odom et al. (2009). This means the value of such collected items does not always come from present use.

In the narrative of the cardigan, Yoon indicated that her cashmere cardigan is her favorite thing out of all of her other clothes. The special nature of the cardigan notwithstanding, we can see that her attachment to clothes and fashion in general is compelling. We learned that she always notices how people are dressed, for example while walking on the street, watching TV shows, or in fashion magazines. From these resources, she always thinks what would fit her well and what she needs to buy compared to what she already has. Sometimes she purchases a whole range of colors of t-shirts in exactly the same style. She explicitly used the notion of collection—*the process of actively, selectively, and passionately acquiring and possessing things removed from ordinary use* (McCracken, 1988; Belk, 1995)—to describe her aspirations for her wardrobe. She is aware that sometimes she buys more than she needs, but in her view, she never makes an impulsive purchase. She always matches a new item of clothing to what she already has, and she as well monitors and regulates her body condition in order to be certain that specific items of the collection will continue to fit and look good. Several years ago, she discarded one of her box-shaped t-shirts that she thought was out of date in terms of style, but after some years passed, a similar design became popular again. She was really regretful of discarding that particular t-shirt, and decided never to discard any of her clothes again. She has learned that certain fashions come in and out of style over time. Whenever she purchases a new item of clothing, she carefully selects what she believes she will be able to wear for decades in her life, considering the quality of material and simple and elegant design, over style trends of the moment. In other words, she selectively collects fashion items, as raw materials, which can be flexibly appropriated to create her outfit as she wants. At the same time, whenever she wears her favorite clothes, she is very conscious about the possibility of dirt and stain. She does her best to do laundry as infrequently as possible, in order to preserve the fabrics as long as possible.

Common Patterns of Attachment

Each of our collected narratives reveals differing motivations for and effects of attachment. Nevertheless, they afford similar stories of attachment starting from interest in certain qualities—either functional or aesthetic—of an object and leading to more knowledge about the details of the object by active learning. We refer to such special qualities of objects that hold intense or specialized interest for a person as *aficionado-appeal*. This appeal is initially grounded in the appreciation of an intrinsic value of objects (as Nozick defines it) and requires knowledge from the user. People who are intrigued by unique qualities of objects—aficionado appeal—willingly, even obsessively, invest time and effort to learn more about the objects. Oftentimes, increasing knowledge about these things is linked to specific interests in things of a similar kind or *genre,* resulting in a person's frequent modification, replacement or collection of things. This finding is closely related to the concept of "possession rituals" by McCracken (1988), which describes a phenomenon of people investing work and time for caring objects. Such objects may or may not be truly ensouled. Still, an investment in a decision about which kind of a device best performs a desired function (as in Joon's optimized

digital ecosystem) or which type of a fashion item best fits to an aesthetic preference (as in Yoon's collection of fashion items) may contribute to the potential for ensoulment or heirloom status of a thing. Such status may eventually become more important than the initial functional or aesthetic reasons for choosing that thing in the first place. Moreover, efforts in finding an optimal object apropos of knowledge of how to appreciate or customize specific qualities of an object can add to the object's story. This additional attachment of a storyline based on qualities developed over time as a result of a person's discernment skill can be as meaningful as actual memories associated with other people or events. Some of the qualities that contribute to the aficionado-appeal of an object include rarity, as well as the investment in learning about the particular object and genre of objects. Specialized knowledge of an object can contribute to a person's ascription of rarity to that object by expressing his or her "taste" and "elitism" in Bourdieu's sense (1984).

There is only so much one can and should infer from a methodological technique like deep narratives which yields only examples of phenomenon, rather than clear and valid generalizations. Nonetheless, we believe that the idea that people tend to have a lot of knowledge about the things they care most about may be a useful general principle that can guide design. This kind of knowledge can be very specific and detailed to the point where our use of the term *aficionado* applies. The insight is similar to the insight about investment of time and efforts to learn and control functionality—that is, if people are invested in knowledge about a particular class of thing of particular personal interest that knowledge can serve as a basis for ensouled, heirloom status relationships with particular designed things. Moreover, such interests are developed over time as a learning process and possible engagement with a community of others who are similarly interested. Subtle differences between things that an ordinary person would not notice at all may become very important and salient distinctions for an aficionado.

As an insight that may modulate our enthusiasm for ensoulment and heirloom status, we should wonder if such aficionado-ism actually leads to more sustainable behaviors. In reality, even if people care about something that is ensouled as a result of their particular expertise about that thing or otherwise, it is possible for them to continuously want to have more of similar things with subtle differences or relevant things to improve the cherished object. From the perspective of sustainability, aficionado-ism is only an asset if it leads to behaviors which preserve and reuse materials and which make wise, needed use of materials. This insight is also a potential principle for design—specifically, designing an aficionado-appeal into something can lead to sustainable behaviors just in the case that the expertise is used to preserve or reuse or make wise use of materials, even as induced by the effects of software.

Differences in Material Types of Objects

The understanding of common patterns of attachment poses a question for interaction designers about how an interaction design can be made to support and enable an object to become special and deeply valued. Such values accrues from, as shown in our study, the perception of an object as being among other things (i) unique, (ii) an encoding of a history or an intimate memory, (iii) one-of-a-kind, (iv) rare, or (v) a record of hard won skill. This insight is closely related to the design opportunities mapped out from the stories of meaningful objects with regard to why an object becomes meaningful and how such emotional ties are linked with a physical object (Mattelmäki, 2006). The implications include a link of a memory, a touch by sensorial quality, a challenge to users, a companion with time, a symbol of self-image, a means of achieving a goal, etc. We can ask several questions about these kinds of perceptions. For example, would the implications be different from physical and digital materials? What kinds of interactive technologies can affect aficionado relationships that are also enduring ones? How can the careful planning exhibited by Yoon be made to be part of the design of digital things in order to encourage preservation of materials and sustainable behaviors of reuse and planning instead of faddism and yielding to marketed obsolescence? Regarding these questions, here we highlight the differences in building attachment between digital and physical material artifacts. Both a similarity and a contrast in the ways in which people are engaged with objects were observed in different narratives of physical and digital things.

First, the stories of Zhou's hard drives and Devin's Cello can be compared in terms of a person's control of both physical and digital types of artifacts. Zhou simultaneously felt attachment and frustration to his hard drives—that is, he sometimes becomes frustrated when the computer and drive automatically synchronize the data in a way that alters his mental map—a problem of bits as material, and he becomes equally frustrated when a hard drive fails for mechanical reasons—a physical materials problem. Of these two problems, it is actually the physical materials problem that is more easily solved by redundancy of equipment, whereas the unexpected reordering of Zhou's mental mapping of where he put what by software is harder to unravel. There is a contrast here, between the way in which Devin's connection to his cello was characterized by his sense of his relationship to the materiality being entirely under his own control and Zhou's connection to his digital materials—his memories—mediated by a force outside of his complete control, namely software. As a unifying hypothesis about Devin and Zhou, it may be that Devin's sense of responsibility for the sound over the actual meticulous maintenance of the physical material of the cello and Zhou's sense of mastery over the organization of his monolithic digital archives are prompts to ensoulment or heirloom status as a form of intimacy and memory. This hypothesis implies that at least some of the ways meaning of object is created are not determined by its material base. This would also lead to the conclusion that studies of physically material objects can partly inform our understanding of digital objects and their design.

Moreover, digital technology can expand the dimensions of using an object—either physical or digital types—by influencing the ways in which people share knowledge and exchange things through online communities. These digitally augmented dimensions can be critical aspects in building aficionado-relationships with things—especially with digital things

considering their specialized and fast-changing features. Joon's knowledge accrued from searching for information on the web and exchanging information through web-based community forums related to specific types of digital products. He has not used his PSP for a long time, but the device has a story reflecting his effort in finding an optimal one for him apropos of his knowledge of how to customize it. For Joon, his present PSP is different from other PSPs—not only because of its customized software, but also because of his trial and error experience with various portable digital devices. Moreover, we could see from some narratives and other studies (Bonanni, Parkes, & Ishii, 2008; Rosner & Bean, 2009) that support for sharing knowledge and exchanging used things via online communication could be an alternative design strategy to promote sustainable use of digital objects. Such online outlets could encourage engagement with an object—by hacking or modifying original functions—as a means of expressing ones' creativity as well as identity, ultimately contributing to building deep attachment to a certain thing.

Reflections and Catalysts to Principles

We have described fifteen deep narratives concerning ensouled, deeply loved objects, which range broadly in terms of types of things. Some are made in part of digital materials, and some are not at all digital. We wanted to understand why some people love some things, and we wanted to know if knowing why some people love certain things can lead to design principles that would foster ensoulment and heirloom status as a catalyst to more sustainable behaviors. Our goal is a design-theoretic goal. In line with some precedent attempts to investigate product attachment (Mugge, Schoormans, & Schifferstein, 2005; Russo & Hekkert, 2007; Schifferstein & Zwartkruis-Pelgrim, 2008), our approach especially aims to reflect on design implications for digital artifacts through deeper investigation of particular stories of things. We are not attempting to add to ethnographic literature. Instead, we are trying to understand what we can advise designers—interaction designers in particular—to do in order to foster more sustainable behaviors.

Three themes emerged as an analytical frame from these 15 deep narratives: (i) intimacy accumulated as an association with an object over time, (ii) investment of effort to learn and control functionality, and (iii) implicit values related to the patterns of collection. In applying these three themes as an analytical frame, we arrived at two distinguished notions that generally apply across many of the narratives and that serve as catalysts to design principles, namely the notion of *rarity of an object,* and the notion of *aficionado-appeal of an object.*

For the notion of **rarity of an object**, we noticed that **memory**—as in the case of the preservation of years of data on the hard drives according to a complex mental map, and **control**—as in the realization that something of self and skill completes an object as in the cello, once imbued in an association with an object are the sorts of qualities that can serve to make that particular object rare. In our narratives, objects that are rare in their intrinsic values included the cardigan sweater, jewelry, the Japanese dinnerware, and the cello. In our narratives, objects that were endowed with a quality of being rare as a result of experience included the laptop, the PSP, the hard drives, the music collection, the desk, the sketchbook, the painting, and the audio player.

A design principle for rarity seems to contrast with everything we know about the digital world, in which copies are essentially free. The challenge for interaction designers is to figure out how to make sure that people perceive or can develop a *sense of rarity* in order to preserve things. An example could be something like a limited edition of some software or specialized versions of software or interactive devices that appeal to peoples' desires to have unique, rare things. Moreover, the strategy for rarity should be different from personalization or customization simply given by a company. It should have a quality to invite engagement to learn more and do something on an object to make it rare—beyond providing ready-made unique things—for an object to be used and preserved over time.

For the notion of **objects with aficionado-appeal**, we noticed that expertise arising out of the time spent acquiring knowledge of something, a class of things, or subtle differences among a class of things, or how to use or care for particular things can possibly serve to make an object ensouled or enjoy heirloom status. We noted that the act of becoming an aficionado with respect to something can drive consumption of material things as much as it can provide a means for preservation, reuse, and adaptation of material things. In our narratives the sorts of things that held aficionado-appeal for our narrators included the collection of early adopter digital devices, the PSP, the cardigan sweater, the music collection, and the cameras. Back to Nozick, *intrinsic values* of such objects have some qualities that prompt people's affection towards them. Intrigued by intrinsic value of an object, people could accumulate meaning to it by learning, modifying or hacking the object, ultimately making the object unique compare to others of a similar kind.

The design principle for aficionado-appeal also relates like rarity to finding ways for peoples' investment in expertise about a class of thing to enable durable relationships, but only in the case that such relationships yield preservation, reuse, and adaptation rather than increased consumption of the materials associated with digital things. In particular, as digital artifacts are becoming objects of blended materiality, that is, partly digital and partly physical, engagement with a digital artifact could be more dynamic than with a physical static one—for example, by including software features to trace history of use and adapt to use, network ability to share knowledge on things and to exchange material things, etc. Such increasing room for appropriation, as a quality of aficionado appeal, could encourage people to learn and re-create an artifact based on their personal motivation and expertise. This support for flexible user engagement in (re-) design process could result in sustainable use of digital artifacts as introduced in studies on future craft (Bonanni et al., 2008), which explores how to integrate digital media into design process for personal fabrication, or craft consumption (Campbell, 2005), which interprets commodities as modular materials for personal re-creation. An example in the software world would be something like Adobe Photoshop which requires expertise gained over time and is essentially a professional tool. The double-edged sword of this principle is evident in the Photoshop example—on the one

hand, new and more powerful versions of Photoshop can drive the demand for new and faster hardware. On the other hand, the ability of an aficionado of Photoshop to customize her or his copy might allow a smaller footprint version of the software containing only the functionality used by the particular aficionado to preserve older machines.

Even on a non-professional level, people do become attached to particular versions of software based on their investment in having learned that version over time. Oftentimes, people resist learning a new version of software. A possible design principle is for interaction designers to think not in terms of providing ever-increasing functionality requiring ever-increasing machine power to support software upgrades, but rather to think in terms of making it easy for people to select small footprint versions of software containing only the functionality that they want to use. Such small footprint copies could be marketed as aficionado, tailored copies, rather than latest, greatest upgrades. This implication is also related to Borgmann's notion of human "engagement" with things—the process of mutual influence between human and object through active interaction (as described in Verbeek, 2005). According to Borgmann, technological products (devices) consist of two elements—*a machinery* (the product as a physical object) and *a commodity* (something delivered when functioning). Upon the ever-growing commodity of recent digital devices, the withdrawing machinery aspect could result in isolation of human engagement in use of digital devices. In this context, keeping traces of use or personalization with selected features of software can provide software-oriented solution for the lack physical engagement in using digital devices (Schütte, 1998; Odom et al., 2010).

Another overarching design principle might be the notion of *improving intrinsic value*. The intrinsic qualities of a design are something that is actually designed (aesthetics, material, form, limited editions, and so forth). In the study we have found several ways by which this can be done—for example by changing the firmware on the PSP in order to allow additional functionality. At the same time, other examples of exchanging used digital devices imply that intrinsic values of high quality materials or specialized features are appreciated even in used conditions. The criteria for long-lasting intrinsic values of digital materials need to be reconceived from a broader context of material culture (Walker, 2006), beyond hardware speed and capacity that cause frequent replacement and discard of outdated digital devices. This might be done in general by (i) making objects rare in numbers, or (ii) by using particular materials, or (iii) by allowing to add functionality, or (iv) with specific attention to appearance and symbolic values in design of physical objects. For digital artifacts, the implication is expanded to consider software or network ability to support engagement by allowing people to appropriate artifacts based on personal values, tastes, and preferences (also as noted in Wakkary & Tanenbaum, 2009).

Conclusions

The relationship between people and things changes dynamically over time with fashion and the introduction of new technologies and other social, cultural, and economic factors. Thus, there is always something to learn from new and continuing studies, and what was learned from prior studies needs to be reviewed, validated, and adapted on an ongoing basis. In our study we show that through careful investigations of individuals and their loved objects it is possible to reveal some of the reasons behind the love. We also demonstrate that it is possible based on such studies to postulate design principles aimed at addressing sustainability issues when it comes to interaction design. However well-intentioned our efforts are, it is also clear that there is a challenge in transforming insights to design principles in this case, and the two principles that emerged from our study—namely *rarity* and *aficionado-appeal*—need to be applied carefully and judiciously in order to ensure that they contribute to the design of things which induce sustainable behaviors as opposed to unsustainable ones. *Rarity* and *aficionado-appeal* are good qualities to consider *apropos* of sustainability, but they can be misapplied from a sustainability point of view. As design principles, these are risky but potentially high-yield principles.

We conducted our study with the goal of developing design perspectives and principles from the outset, rather than observing peoples' relationships to loved things as an end, *in-and-of-itself*. This gives a flavor to our treatment, which we argue is a pragmatic point of view, especially in a sense that the analysis and reflection of our collected narratives can broaden the understanding of human interaction with digital devices to relationships between people and things in general. This is done by contextualizing philosophical and theoretical foundation of material culture and sociology into design implications based on specific findings from the narratives. Our pragmatic approach is not intended to engage in the debate in human-computer interaction about ethnographic methodological orthodoxy, but rather to contribute principles in a carefully reflective way and serve as a model for practical design research that any designer can use.

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