

# Designing for the Self: Making Products that Help People Become the Person they Desire to Be

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## ABSTRACT

Product attachment theory describes how people learn to love certain possessions through a process of meaning making. It provides a rich and as yet untapped source of inspiration for driving the practice of experience design. However, there are currently no guidelines that describe how to apply this theory in design practice. Taking a research through design approach, I made many different products with the goal of helping people *become the person they desire to be* through their product interactions. Then, in order to better understand how the different design teams applied attachment theory, I created a set of design patterns that document the application of product attachment theory to the interaction design of each product. I clustered the patterns based on similarities across the different artifacts, and this produced six *framing constructs*, which work as specific perspectives designers can take when applying product attachment theory in an experience design project.

## Author Keywords

Designing for the self, experience design, product attachment, loved objects.

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

As a designer, I have always wanted to make “*things*” that *people come to love*; things that become meaningful through use in activities, relationships, routines, and rituals.

For the last several years the HCI community has been undergoing a broadening of scope from *usability* to *user experience*; making things that improve the quality of people’s lives across a range of contexts. Our community has recognized that in addition to making products that

make people more efficient and effective, we need to learn to make things that affect people in a variety of ways. One area that seems potentially rich but that has received little attention is the research on product attachment, which describes how people come to *love their things*. People invest psychic energy into their possessions, developing attachment through repeated use as they engage in the activities that give their lives meaning. The research on product attachment describes how attachment develops out of a process of identity construction, where people learn to love the things that help them understand themselves in a role they care about. What the theory does not offer is any guidance on the process of making things people will love.

To investigate the value of taking a product attachment perspective in the practice of experience design, I used a research through design approach [48], making many different artifacts. Through a process of making and reflecting, I developed a philosophical stance called *Designing for the Self* that has two focuses: (i) *Role enhancement*: the design of products that help people move closer to their idealized sense of self in a specific role through their interaction with the product (products that help people become the person they desire to be) [35]; and (ii) *Role transition*: the design of products that support the process of discovering and inventing yourself in a new role [49]. This paper exclusively addresses role enhancement.

The artifacts range from an alarm clock that keeps small children in bed to a mobile phone that helps Zen Buddhists practice their religion. These are all one-off designs, specific to different product forms, contexts, and user needs. The one-off nature of each makes it difficult to see connections between the different designs or to draw any larger insights on how to apply product attachment theory in a design practice. In order to advance the application of a product attachment perspective, I selected six artifacts and produced design patterns [2] for each. These patterns document how the design team intentionally connected product attachment theory to the product’s interaction. I clustered the patterns based on similarities in the application of the theory, and this revealed six *framing constructs*: rich starting places for interaction designers to find traction in connecting product attachment theory to the design of a new thing. These starting points help designers to more quickly find a viable approach to making products

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CHI 2009, April 4–9, 2009, Boston, Massachusetts, USA.

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that have the intention of being a companion in the user's life and have the intention of forming a strong attachment with the user by helping them move closer to their idealized sense of self in a role.

This paper provides a brief overview of the research on product attachment and how this leads to the philosophical stance of *designing for the self*. Next, it details the process of designing and selecting of the six artifacts, and the development and clustering of the design patterns. Finally, it details the six framing constructs and discusses *designing for the self* as a philosophical stance.

## BACKGROUND

More than 100 years ago, William James noted that people considered their possessions to be a part of their self [22]. In exploring this theme researchers have characterized the connection between the self and objects in various ways. Goffman connects objects and identity by characterizing certain objects as “props” that support people's presentation of self [19]. Csikszentmihalyi and Rochberg-Halton discuss attachment as a result of “meaning making” that grows out of product use and involves a process of establishing and working toward life goals [8]. Turkle describes how objects perceived as “evocative” — that help people to think — depend “...not on the object's instrumental power ... but on the object as a *companion* in life experience.” [42, page 5, my emphasis].

Product attachment has been a particular focus of consumer behavior researchers as they investigate why and how people develop a love for their things. They describe possession attachment as a result of *self-extension*, detailing how people extend their sense of self to include important people, places, and things [3]. The attachment to a possession develops through a process of identity construction. People develop a reflective sense of self in relationship to a thing through both anticipating how people will react to their possession and use, and through their observations of how people actually react to their possession and use [3].

Two important constructs that have advanced possession attachment theory are narrative and social role [1]. Consumer behavior researchers have turned to McAdams' concept of identity construction as the development of a coherent life story: an integration of different stories that unite events from someone's past, experiences from the present, and imaginings of the future [32]. Products gain attachment by playing an important role in a person's life story. Specifically, people feel a strong attachment to products they possess that reinforce affiliation to groups that have been important in their life story and products that capture and communicate their autonomy both in their past and in the present [27]. In addition, researchers found that the selection of new products is more strongly influenced by people's social identity (sense of self in a specific role) and their ideal identity (idealized sense of self in a role) than by their core self [25].

As a concrete example of product attachment, consider the books that parents read to their children at bedtime. Over repeated use, these books can become invested with meaning, as they become markers of moments when parents felt they were being a good parent by reading to their children during the intimate bedtime ritual. Years after the children have grown, these books often remain in the parents' home. The parents' attachment is de-commoditized in that it forms with the specific books the parents read, and not with any copy of the same book [26].

The product design research community claims there is a benefit in taking a product attachment perspective to product design [20]. They note that if designers can intentionally make products with a stronger likelihood of attachment, this might increase sustainable behavior by implicitly encouraging people to upgrade objects less frequently [38]. However, they have not yet provided a process for applying these theories in design practice or examples of artifacts created with a product attachment consideration in mind.

The research on product attachment all points to identity construction as a critical activity in the development of attachment, and interestingly, this connection between identity construction and attachment has been found for brand attachment, place attachment, and experience attachment [26]. In general, the product attachment research has focused on how people drive the identity construction process by selecting and using products that can be characterized as static. They construct their self by developing a network of products that represents who they were, who they are, and who they want to be.

Interactive products offer a new opportunity for designers in that the product's behavior can be designed to make it a much more explicit collaborator in a user's identity construction activities. The philosophical stance of *designing for the self* asks interaction designers to make products that consider identity-construction as an interactive goal, and it asks designers to make products as intentional companions in a user's construction of a coherent life story.

## New perspectives for advancing experience design

Designers work to find a new perspective, a novel framing of the situation that helps them make valuable new things [29]. In the HCI community's transition from a narrow focus on usability to a broader focus on user experience, researchers have articulated many new perspectives that have led to both the conception of experience design and advances to experience design. Below I provide a very brief overview of some of this work.

Research on the “four pleasures” emerged out of the frustration with a human factors approach to the design of increasingly complex consumer electronics, products generally designed for leisure activity. Following this approach, designers can increase their likelihood of making

a commercially successful product by applying the lenses of physiological pleasure, social pleasure, psychological pleasure, and ideological pleasure [23]. In this pleasure approach, designers are encouraged to hierarchically consider functional needs, then usability, and then pleasure.

A topic of increasing interest in the design and HCI communities has been emotion. Norman's book on the topic provides a framework with three levels at which products can trigger an emotional response: visceral, behavioral, and reflective [33]. *Designing for the self* intersects with this framework at the reflective level, where a design triggers a past memory, making people self-reflective. While the visceral and behavioral levels can be pursued through a design focus on aesthetics, functionality, and usability, Norman offers no insights on how designers can increase the potential of a product to develop a reflective level of emotion. This is exactly what *designing for the self* attempts to do by taking a product attachment perspective.

In addition to frameworks, design researchers have characterized emotional triggers from product designs as judgments [14], and they have developed remarkable tools for assessing people's emotional reactions to product form [13]. The research on design and emotion has helped the HCI community to consider many new issues beyond usability, and it has helped designers to better understand and investigate people's reactions to the things they make.

The transition from mechanical to digital devices freed designers from explicitly needing to connect interaction to the mechanical constraints of a device. For example, devices no longer need button presses that physically place a read-head onto magnetic tape. Surprisingly, instead of leading to a richer range of expression, most digital devices reduced interaction to simple button presses. Investigations of the aesthetics of interaction led to the idea of emotionally rich interaction [46] as well as design methods to help teams discover novel ways for people to express their intention to a system and for systems to provide more expressive feedback [13]. This work advances experience design by providing a path for interaction designers to see past the conventions (current interaction design patterns) that limit their ability to discover and invent novel solutions.

To help with the transition to experience, several HCI researchers have provided frameworks that detail many different influences. One of the earliest links experience to narrative and storytelling [17]. In addition, Wright et al. build on Dewey's characterization of experience as something that cannot be reduced, and in proposing a framework, they specifically note the role of self in how people make sense of their experiences [47]. *Designing for the self* does not take nearly as broad a view as these frameworks which try to fully capture all important aspects with respect to the way people gain meaning from product interactions. Instead, it focuses more narrowly on self and

life story as important opportunities designers can apply in practice.

Most of the HCI research that has helped designers gain new perspectives during the community's transition to experience design has focused on the experience at the moment of interaction or on the immediate outcome following interaction. One notable exception is the work on worth-centered design that discusses the value that emerges from repeated use; a longer-term outcome of interaction [8]. *Designing for the self* picks up this theme, asking designers to address both the immediate needs as well as the outcome of repeated interactions that lead to product attachment.

### Design Patterns

As designers repeatedly encounter and solve the same challenge, design conventions form. The conventions arise as designers come to an implicit agreement by repeatedly addressing a problem in the same or similar way. Design patterns are simply a formal way of documenting a convention. They transform what is often an implicit guideline into an explicit understanding of convention, offering designers more awareness of the conventions they choose to follow, ignore, or challenge.

While design patterns were originally developed to capture patterns in architecture [2], they have proven to be much more popular in computer science, particularly in object-oriented programming where many books have been written that document how to address common programming challenges.

In the HCI community, patterns have been used in at least two different ways. The most popular use has been to document conventions that have arisen around specific interaction challenges. The book by Van Deyne et al. documents many patterns for the web [44]. In addition, many web sites have appeared that continually update web interaction design patterns as the web continues to evolve [21, 43 (just a few of many sources)]. HCI researchers have also used design patterns to capture very early conventions in ubiquitous computing applications, and have taken to calling them "pre-patterns" as the conventions have not yet firmly developed [7]. The second use of design patterns in HCI has been as a method of analyzing user research by lifting out the patterns of people's behavior. While less popular than the use of patterns to document specific interaction designs, the use of patterns to create meaning from fieldwork shows promise [30, 43].

The use of design patterns in HCI to document patterns in people's behavior and to document conventions in interaction design, as well as the use of patterns in architecture and in object-oriented programming help to illustrate the flexibility this method of analysis and documentation can provide. In this project, design patterns were used not to capture interaction design conventions across many similar products, but instead to document how

a design team applied product attachment theory to the interaction design of a specific product.

## PROCESS

Since the literature on product attachment offers no insights on how to apply product attachment theory in the process of making new things, I chose a research through design approach, making *things* with the goal of gaining insights on the making of this kind of thing [48]. In this case I wanted to produce insights on how to *design for the self*. I began by making many things focused on role enhancement. I then selected a small subset and produced design patterns for each product that makes explicit how product attachment theory was applied. Finally, I clustered the patterns based on similarities in the application of theory across the different designs. This produced the six framing constructs: rich opportunity areas designers can use as perspectives when attempting to apply product attachment theory at different points in the design process.

I worked with many different design teams, applying a product attachment perspective to the design of more than 20 different products. These ranged from low-fidelity, foam core prototypes that could be played with by target users; to concept videos documenting how users interact with and benefit from a product in different contexts; to robust devices ready for deployment and evaluation in the field. All artifacts were created following a user-centered design process involving the following steps:

1. Focus setting — identify a target set of users and a problematic situation for these users that has the potential to connect to identity construction. In general, this involves finding situations where people enact a role that is particularly important to them
2. Literature review — identify and read the research literature related to the problematic situation, particularly the behavioral theory, but also the technical advances that researchers have connected to this problem.
3. Field work — engage in field work including observations, interviews, and cultural probes to gain a grounded and empathic perspective on the problematic situation.
4. Modeling data — construct models that reveal patterns of user behavior, influences, and triggers.
5. Concept generation — generate concepts based on technology opportunities, behavioral theories, and fieldwork data. Cluster to reveal themes and opportunity areas.
6. Speed dating — evaluate the opportunity area through speed dating using needs validation and, in some cases, user enactments [12]. Speed dating allows designers to create many possible futures and then to draw on target users' current experiences while placing them into several possible futures in order to find more valuable opportunities.
7. Refinement and final design — design a single artifact that addresses the problematic situation.

I selected six artifacts for further analysis from the more than twenty that had been produced. Many of these had been designed to help dual-income parents become the parents they desire to be. I focused heavily on this group because they are aggressive adopters and experimental users of technology in their quest to be better parents [11], and for the pragmatic reason that a focus on one audience allows for the reuse of fieldwork. However, other target groups were also explored. The selection process favored more fully realized designs — designs with a higher level of fidelity. The selection was also influenced by a desire to broadly cover different product forms, problem spaces, and user groups. Below is a brief summary of each of the six selected artifacts.

**Cherish:** smart picture frame for the home [24].

The Cherish photo frame attempts to improve the quality of families' lives by increasing the social interaction around frames. The frame has three main applications. First, it allows people to rapidly redecorate based on a person coming in to the home. Second, it can automatically update a frame, either refreshing the image of a single person at set intervals or displaying previous events such as holidays based on the near arrival of that event. Third, the frame allows people in front of the frame to opportunistically share the displayed image with people at a distance.

The frame is “socially” aware. For example, in a divorced family, the “right” grandparents would appear in the frame based on the children that are present. The design addresses the home as an expression and a presentation of self for the family. It provides more control over self-presentation by making it easier and faster to “redecorate” based on changing social factors. In addition, it works as a more present reminder to the family identity by refreshing photos in frames around the home, reminding the family of who they are and what they have done as it builds anticipation for future events.

**Smart Bag:** object sensing athletic bag for children [28].

In our research with dual-income families we observed many people using athletic bags to organize their activities. They would place all the equipment they needed in a single bag and place it by the door for a speedy exit. Parents packed the bag for their children. They wanted their kids to be more responsible for their activities, but in the rush to get things done, parents often found it easier to do the work themselves.

The Smart Bag helps families by providing a platform for young children to begin taking over responsibilities for their enrichment activities. The bag connects to the family calendar and downloads a list of upcoming events and equipment needed for these events. It senses its contents and then using lights and sounds, it communicates that everything is ready or that items are missing.

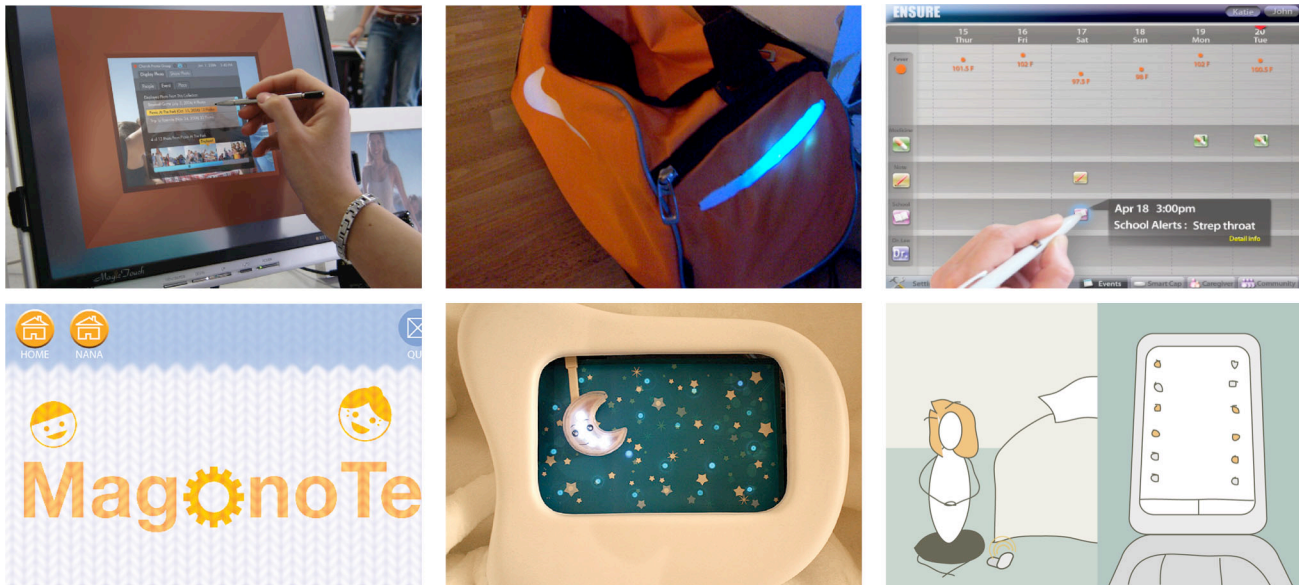


Figure 1. Images of selected products from left to right, top to bottom: Cherish • Smart Bag • Ensure • Magonote • Reverse Alarm Clock • Shared Moments

**Ensure:** recording, retrieval, and reminder system for children's medical information [36].

Parents with young children often experience great stress in recording, retrieving, and sharing their children's medical information. For example, parents will write down when they give a child medication near the medicine bottle, so another caregiver in the home can access this information, but that message cannot be retrieved when they are not at home. In addition, when they must engage in activities outside of their routine, they often experience breakdowns. For example, when a child is sick and needs antibiotics, the child's sick appearance works as an immediate reminder to give the medication, but as the child begins to feel better, the reminder goes away. As a result, parents often feel they are performing poorly in managing their children's health.

The Ensure system makes it easier to record medical information, allows for retrieval of this information both in and outside of the home, and provides feedback and reminders for parents and childcare providers related to a child's health. The system uses smart medicine bottle caps to detect and record if and when medication has been given, and it automatically records a child's temperature when the thermometer is used. Parents can easily access this and other medical information via a touch-screen in the home or their mobile phone, improving the accuracy of information they give to healthcare providers and childcare providers. The system helps parents take better care of their children.

**Magonote:** allows for remote support of an extended family member's television system [18].

Most consumer electronic manufacturers have struggled to make home electronic interfaces "simple" while increasing the complexity of what these systems can do. Their main

approach has been to focus on making the system "easy" enough for everyone in the family to use. However, in many families there is one person who installs and maintains these home media systems, and they gain social value by supporting their immediate and extended family members.

Magonote challenges the fundamental goal of consumer electronics interface design. Instead of making products easy enough for everyone in a family to use, this system allows one person to remotely control the configuration and activities of networked devices. Magonote, a Japanese term meaning grandchild's helping hand, provides an opportunity for family members to help and be helped by one another.

**Reverse Alarm Clock:** keeps young children from waking their parents at night [35].

This clock abstracts the display of time in three states: (i) when the moon is up, stay in bed; (ii) when the moon has set, get out of bed *if you wish*; and (iii) when the sun rises, get out of bed. Parents use the wall controller to set the moonset and sunrise times, allowing the moon to set at different times on a weekday or weekend. Children can take some control of their wakeup experience by select their own wakeup music using a treasure box that sits on their nightstand. They can also turn the system on at bedtime (making the moon rise) by pressing a button on the top of the treasure box.

The clock addresses the increased stress parents feel when they are sleep deprived, stress that makes it easier for them to lose their patience when interacting with young children. In addition, the display of time provides a platform for helping young children learn to make good decisions. When a child wakes in the night, they must decide if it is

appropriate to break the rules. Did they have a bad dream? Do they need to use the bathroom? Or should they simply go back to sleep.

**Shared Moments:** mobile phone applications that strengthen Zen Buddhists connection to their *Sanga* (community) [40].

The interaction design community has largely ignored religious practice as an opportunity for technology development, yet many different religious communities are inventing new and interest methods of participation via mobile phones. Buddhism has a specific challenge of asking participants to be present in the world, while mobile phones have the general effect of reducing people's social participation in their current place. This project was an exploration to see if there was an opportunity for a mobile phone to help make a Buddhist feel like they were becoming the kind of Buddhist they would like to be.

The Shared Moments phone application allows users to remotely participate in meditation with members who are physically present at the Zen Center. It allows for opportunistic capture and sharing with the community of reflections on recent teachings. Finally, it provides reminders of important precepts for users who are out in the world, based on events and actions within the Zen Center. The phone interactions keep the religious community in focus as users carry out their tasks of daily living.

### Design Patterns

My goal in analyzing the different design projects and artifacts was to gain higher-level insights into how product attachment theory can be applied in a design process than a single design case can provide. I chose to use a design patterns approach to discover these insights for two reasons. First, design patterns can capture seemingly implicit decisions in the design process and to make them explicit. Second, design patterns have shown tremendous flexibility as they have been used for architecture, object oriented programming, interaction design, and in the analysis of ethnographic data.

In creating the patterns I chose to focus on how product attachment theory was applied in the individual design cases. This stretches the scope of patterns in two ways. First, this produces patterns from an individual design instead of from repeated instances that reveal conventions across many similar designs. Second, these patterns focused on the application of theory in the users' interactions with a product, something I have never seen patterns used to document.

To create the patterns I created and iteratively refined a design pattern structure to help make the connection between theory and the interaction more visible. The structure evolved as I examined and reflected on the process and outcome of each design. Table 1 provides both an overview of the structure and an example of one of the design patterns. The elements that proved to be most

helpful were the "Example", which connects the pattern to a specific interaction in a specific design; the "Attachment", which describes how the attachment is intended to form; the "Forces" that document the elements in play that create the opportunity for the attachment to form; and the "Solution", which provides an abstraction of the approach, allowing it to be more easily compared to other patterns.

Title:	Fully become a parent for bedtime
Example:	The Reverse Alarm Clock uses a treasure box on the child's night stand and a design choice of needing to turn the clock on every night as a way of placing product interaction between the parent(s) and a child at a point where the parent is fully engaged in their role as a parent.
Context:	Child's bedroom just before they go to bed.
Attachment:	Parents feel a strong attachment to the physical books they read to their children at bedtime. They seem to associate the books with being a good parent.
Forces:	Parents have many roles that need their constant attention. Parents need to finish maintenance tasks such as dishes, lunches, laundry that must be finished before they can go to bed; parents need some "me" time and "couple" time outside of work and child-raising. Parents multi-context, rapidly switching between roles to address the needs of their many responsibilities more opportunistically.
Solution:	Place interaction with product at a point where parents are not multi-contexting, where they are fully engaged in being a parent.
Resulting Context:	Product interaction creates opportunity for parents to fully enact the role of parent.

**Table 1. Example of design pattern for the Reverse Alarm Clock**

### FRAMING CONSTRUCTS

After producing several patterns for each one-off design, I made an affinity diagram, clustering the patterns at intersections where the different designs showed similar opportunities for product attachment theory to connect with the interaction design of a product. Through a process of clustering and re-clustering the patterns, six categories emerged:

1. Role engagement
2. Control
3. Affiliation
4. Ability v. bad habit
5. Long-term goals
6. Ritual

I refer to the categories as "framing constructs" because they reveal repeated opportunities designers have used to

attach the theory to the interaction design of a product, and they provide lenses designers can use for framing the problem and solution to their design challenge. Below I detail how the different designs connect to a specific framing construct, linking the product attachment theory to the interaction design.

**Role engagement.** As people perform the activities of daily living, they switch between the various roles they play. For some people, the switching becomes so rapid, that they engage in multi-contexting [10] enacting several roles nearly simultaneously as they perform tasks related to different roles in parallel. Three of the designs apply product attachment theory by focusing on having people fully engage a single role. The *Reverse Alarm Clock* does this by situating the interaction with the clock in the intimate bedtime routine. At this time parents temporarily abandon their other role as they focus on creating a relaxed and quiet environment in order to get their child to sleep. The clock does not create the opportunity, but instead places its interaction at a time when the parents are fully engaged in that role.

*Magonote* and *Shared Moments* take a different approach, allowing for interruptions to remind users of an important role. For *Magonote*, this happens when a relative calls the technology lead and asks him or her to provide help with their system, creating an opportunity to engage the role of helpful child or grandchild. For *Shared Moments* this happens when the phone provides a reminder for the user to think about one of the important precepts of Zen practice. In both cases, the interruption creates a small moment for people to step away from their own busyness and to fully engage with and enact a role of particular importance to them. The designs allow for concrete instances where users can focus on who they want to be in a role by dropping the other roles and focusing on one.

**Control.** Control is a perennial issue in HCI and interaction design, and four of the artifacts focus on increasing the user's perception of control through: control of devices, control over space, opportunistic access to critical information, and control over the behavior of others. *Magonote* and *Reverse Alarm Clock* address control of devices. With *Magonote*, the technology lead in the family has the ability to remotely control the consumer electronic devices of other family members. This allows them to address issues immediately but also creates the obligation to fix problems as they are reported. The *Reverse Alarm Clock* creates the opportunity for a young child to control the clock instead of being controlled by it. Specifically, the clock increases the child's agency by allowing him or her to select their wakeup music. Additionally, when the child climbs out of bed at the appropriate time — when the moon has set but before the sun rises — the action of leaving the bed triggers the sun to rise and the wake up music to play. In this way the bed itself becomes a giant button that the child can operate by getting up.

*Cherish* takes a control over space approach, allowing a homeowner to rapidly redecorate their house as a reaction to the news that someone is coming over. For example, in a divorced family with children from two previous marriages, the “right” grandmother can appear in the living room for the right set of children. Spaces, and especially spaces in a home, are one of the primary ways that people present themselves. The ability to rapidly change a space to tailor to an immediate social need allows people with more subtle, expressive control, but it also raises issues of authenticity as the appearance of a person in a *digital* frame may overtime be viewed as being temporary.

*Ensure* provides busy parents with a feeling of control over a variety of situations — usually medical in nature — by providing immediate access to information needed to take action. The system tracks when children take medication reducing the chances of over- or under-medicating when parents trade off responsibilities for the kids and forget to explicitly communicate that medication has or has not been given. Additionally, it allows parents to remotely retrieve important medical history information such as when a child took medication, recent temperatures, vaccinations, etc. via a mobile device. This remote access to information allows the parents to provide more accurate information to healthcare providers, particularly during stressful moments when they are dealing with a sick child.

In addition to providing device control for children, the *Reverse Alarm Clock* helps busy parents control their children's behavior. Primarily, the clock is focused on keeping children in bed by providing an age appropriate abstraction of time information. Parents gain additional control because the clock allows for a relative display of time. The wall controller allows parents to rapidly and easily change the moonset and sunrise times, allowing the specific times that children are required to be in bed to be different for different days. For example, Sunday and Monday can easily have different moonset and sunrise times, but the parents do not need to establish different rules for the different days.

**Affiliation.** Three designs build on the consumer behavior theory that products develop attachment through affiliation. *Shared Moments* allows Zen practitioners to build and grow their affiliation by opportunistically allowing users to capture images and share them in relation to stories the group shares. The images from others provide a reminder of affiliation, and the ability to share provides a method to reconfirm a connection with the group.

*Magonote* addresses affiliation with family and *Cherish* addresses affiliation with family and friends. *Magonote* creates the opportunity for family members to ask for help and for the “technology lead” to provide that help. Designed for Japanese homes, the system's interaction builds on the idea of a child's obligation to their parents and grandparents as a positive expression of love. *Cherish* works to increase social interaction in the present by



recalling shared activities in the past. By selecting and displaying images of the people in the vicinity of the frame, the device helps people to reminisce about their shared experiences, and it reminds the user of people that are important in his or her life.

**Ability & bad habit.** Four of the designs connect to product attachment by either providing people with additional abilities that reduce their mistakes or by addressing their less than desirable habits. Parents often have conflicting schedules and complex responsibilities related to work, school, family, and enrichment activities. When things go well, no one notices, but when they experience breakdowns, children particularly notice and parents feel embarrassed. In addition, parents desire to demonstrate an effortless mastery of the busyness in their lives to their children as an example of how to live [11]. *Smart Bag* helps the family to not forget items needed for activities and *Ensure* helps parents retrieve the information they need and remember to give their children medication. These devices help parents to demonstrate that they are in control of their lives.

The *Reverse Alarm Clock* takes a different approach, providing different services to parents and children. Busy parents occasionally yell at their children during the stress of the morning rush, and they then feel they are bad parents as they send their children off for the day on a negative note. The clock helps keep small children in bed at night. This allows parents to have uninterrupted sleep, giving them a bit more emotional reserve to deal with the stress of the morning. From the child's perspective, the clock directly addresses their bad habit of getting their parents up at night and gives them the opportunity to demonstrate good behavior by changing their habits and staying in bed.

*Magonote* addresses the bad habit some children have of not responding to their parents' requests. By allowing the technology lead to remotely access and control the consumer electronic devices, this system provides an easy way for children to listen and respond quickly.

**Long-term goals.** Three of the designs focus on making long-term goals more present in people's lives. *Smart Bag* addresses parents' desire to teach and give their children appropriate responsibilities as a way of preparing them to succeed in the world. The bag allows busy parents to have their child prepare items for the child's activities, knowing that critical items will not be forgotten. The *Reverse Alarm Clock* addresses the long-term desire parents have to teach their children to make good choices. By presenting time as an abstraction small children can understand, the clock creates an opportunity for a child to practice following the rules by staying in bed or choosing to appropriately not follow the rules by getting their parents up when they are sick or have had a bad dream. *Cherish* focuses on the long-term goal of maintaining important social relationships. By automatically refreshing the frame with new pictures of the same person, the frame makes that person more visible in

the environment, providing a subtle reminder of that person's importance. In all cases, the devices reduce the noise of the needs in the immediate situation, allowing long-term goals to temporarily come into focus.

**Ritual.** Two of the designs look to the participation in ritual as a connection to product attachment. *Share Moments* allows the user to remotely participate in the weekly ritual of group meditation. The user can see a display on his or her mobile phone showing the number of people meditating at the Zen center. The sound of the gong at the center keeps both local and distant practitioners linked. In addition, the remote participant's presence is communicated to the group via an ambient display above the altar.

The *Reverse Alarm Clock* situates itself in the intimate bedtime performance. The clock needs to be turned on each night as the child goes to bed, bringing it into focus within the ritual parents and children have co-constructed. In both cases the interaction designs intentionally draw on the process by which objects transform from profane to sacred by becoming a part of a ritual [4].

## DISCUSSION

My use of design patterns deviates fairly widely from their intended purpose of documenting and making explicit design conventions. The design patterns from the individual products are not particularly valuable to other designers, because they do not document a general solution. However, they worked very well to illuminate the link between design intention (application of product design theory) and the designed artifact, allowing the similarities in the application of theory across the very different design projects to be seen. In the end, while the design patterns took much time to produce, their use proved to be very effective for revealing the opportunities where designers can apply product attachment theory to an interaction design.

It may seem that the *framing constructs* produced from the analysis of the design patterns should in fact be design patterns, as they attempt to capture what is similar across more than one example. However, they come from a very small sample of artifacts, and they look at a very narrow aspect of a design — the connection of product attachment theory to the interaction design. While I do hope they eventually evolve into design patterns, they are currently too immature. Nevertheless, they are still valuable to design teams that wish to take a *designing for the self* stance and apply product attachment theory in a design project.

Design teams can apply the framing constructs at three points in the design process: user research, ideation, and iteration. When conducting research, the team can look for specific examples where the framing constructs function in the lives of their target group. For example, they can probe participants on the *rituals* related to an important role in terms of the design project, and they can probe if the participant has developed attachment to the artifacts currently used in this ritual.



In the ideation phase, when a team generates many different conceptual ideas, the team can use each framing construct as a jumping off point, brainstorming and developing scenarios that capture the intersection of the observed user needs from the fieldwork and the construct itself. For example, a team could begin a brainstorming session on role engagement, starting at a point when a person is fully engaged and inventing a product concept that could trigger or help maintain the role engagement.

In the iteration phase, when a team has identified a specific concept direction, they can systematically go through each framing construct, working to see if it is actionable in their current design. By moving through each framing construct individually, the team can more easily identify which constructs best fit with the emerging design.

I want to step back for a moment to more broadly consider the idea of *designing for the self* as an advance to experience design. The intended outcome of this approach — making someone feel they are becoming the person they desire to be in a specific role — is a very difficult thing to measure because it is nearly impossible to control for. In addition, the effect of any product would most likely be very slow, requiring many years of interaction for the desired effect to take place, because it works at the same pace as product attachment develops.

The framing constructs produced by this analysis in no way function as proof that *designing for the self* is an effective advance to experience design, because the outcomes are hard to measure and it would take many products and many years to know if it works. Instead, if an experience design team accepts the argument that a product attachment perspective adds value to experience design, what the framing constructs provide is a concrete way for them to begin to apply this approach in their own practice.

## CONCLUSION

During the transition to experience design, the HCI community needs to consider many new perspective on how interactive products can bring value to people's lives. The research on product attachment, detailing how people learn to love their stuff as a process of meaning making and identity-construction, appears to provide a valuable new consideration for experience designers. To investigate this perspective, I designed several artifacts made with the intention of helping people become the person they desired to be in a specific role. These artifacts were then analyzed using design patterns that document how a design team intentionally linked the theory to product interaction. Clustering the patterns based on the similarity in the application of theory revealed six framing constructs: starting places designers can use to jumpstart the process of applying product attachment theory in a design process.

## ACKNOWLEDGEMENTS

I wish to thank the many students and colleagues who led and collaborated with me on the designs detailed within. I

would also like to thank Kursat Ozenc, Scott Davidoff, Ian Hargraves, and Miso Kim for their ongoing discussions of *Designing for the Self*.

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