# Conveying User Values Between Families and Designers

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## ABSTRACT
Current research in domestic technology focuses on a subset of the breadth of values that may be present in the domestic environment. In this paper, we present one possible method for conveying a larger potential breadth of user values between families and designers. We describe the ways that we tailored cultural probes specifically for values elicitation as well as the results of both families' and designers' interactions with the probes. We also draw from the social psychology research of Milton Rokeach, whose framework for values was used to scaffold designers in foregrounding user values in domestic design.

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Values, domestic technology, probes, design

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## INTRODUCTION
An increasing amount of research in the human-computer interaction (HCI) community addresses the role of computing technology in domestic environments (e.g., [3]). It is clear from this research that designing for domestic environments is different from designing for work environments. The differences become apparent, for example, in the new methods, such as cultural probes [6], that have been developed to address the challenges of conducting research in this new setting. Implicit in many of the discussions of these differences is an acknowledgement that the values in the domestic environment are substantially different from the traditional values of the workplace and the traditional values supported by computing technology.

Social science research offers a broad, commonly referenced, and rigorously validated framework of values that may function as a useful tool for domestic design. Social psychologist Milton Rokeach identified 36 distinct values [11], including 18 instrumental values reflecting desired modes of conduct and 18 terminal values reflecting desired end-states [Table 1]. Although the Rokeach taxonomy of values is not limited to domestic values per se, we believe the domestic environment is the primary setting through which people are most free to express the many different values in Rokeach's taxonomy.


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Within the HCI community there are, broadly, two complimentary research programmes in domestic technology. The first reflects a more traditional, needs-based approach to design. This approach is exemplified by the Aging in Place research agenda, designing and studying technologies (e.g., [10]) to enable aging adults to remain safely in their own homes and to provide peace of mind for their adult children. This more traditional, needs-based approach also includes research in communication, coordination, and awareness technologies (e.g., [2, 8]). Almost overwhelmingly, this research programme reflects the value of *family security*, defined by Rokeach as "taking care of loved ones" [11]. Research into coordination technologies may reflect an additional value of being *responsible*; some of the awareness technologies as well as the Aging in Place technology may support the value of being *independent.*

The second broad research programme in domestic technology has strong roots in design. Frequently, the goal of this research programme is less to reflect the user's specific needs as it is to reflect the designer's eye for provocation. The most predominant focus of this research is on designing for ludic engagement, for playfulness, curiosity, and fun [1, 7], reflecting values such as *pleasure* and being *imaginative* — distinctively non-traditional values for computing technology.

| *Instrumental Values* | *Terminal Values* |
|---|---|
| Ambitious | A comfortable life |
| Broadminded | An exciting life |
| Capable | A sense of accomplishment |
| Cheerful | A world at peace |
| Clean | A world of beauty |
| Courageous | Equality |
| Forgiving | Family security |
| Helpful | Freedom |
| Honest | Happiness |
| Imaginative | Inner harmony |
| Independent | Mature love |
| Intellectual | National security |
| Logical | Pleasure |
| Loving | Salvation |
| Obedient | Self-respect |
| Polite | Social recognition |
| Responsible | True friendship |
| Self-controlled | Wisdom |

**Table 1. Rokeach's instrumental and terminal values**

Even taken together, these two vastly different research programmes do not reflect the breadth of user values that have been articulated by social science research. There are many other values and many other highly prioritized values (e.g., *honest*, *forgiving*, *self-respect*) not currently being reflected in domestic technology research.

In the remainder of this paper, we present two phases of an exercise in conveying a broader potential of values between families and designers.

### A Note on Values

Previous research on values in the HCI community, such as that of Friedman [4] and Muller et al. [9], has focused on designing to support moral values of human welfare and justice. In contrast to this important research agenda, we emphasize foregrounding the values of specific user populations and allowing their values to seed the design process.

## AN EXERCISE IN CONVEYING VALUES

The goal of this research was to understand how one might more intentionally support the potential breadth of user values in the design of domestic technology as well as to assess the utility of Rokeach's values framework as a tool for domestic design. To this end, we conducted an exercise in conveying values and explored relationships between families' self-reported values and designers' understandings of those values as communicated through a values-foregrounded version of cultural probes.

### Methods

There were two phases in assessing whether values could be conveyed: gathering family values data and generating value inferences based on that data.

#### *Gathering Family Values Data*

To gather data about user values, we created a version of cultural probes [6] designed specifically to elicit data about values from families [Table 2]. As a starting point for data collection, the use of physical probe artifacts resonated with our initial intuitions that concrete representations of the families would be an important tool for design teams' negotiations about the families' values. We systematically adapted cultural probes by considering different manifestations of values, different expressions of values, and not only *what is* but *what could be*. Each of these adaptations will be discussed in more detail in the next section.

In addition to asking families to complete the value probes, we also asked families to complete the Rokeach Value Survey [11]. The Rokeach Value Survey involves rank ordering the two lists of values — the 18 instrumental values and the 18 terminal values.

Two families' interactions with the value probe activities and the Rokeach Value Survey were observed by a member of the research team.

#### *Generating Value Inferences*

We convened four teams of HCI graduate students for the second phase of the exercise. Although not professional designers, these students' educational background is similar to that of many practitioners in industry who are engaged in designing future domestic technologies. Three teams had two members; one team had three members. Two teams worked with data from the first family; two teams, with data from the second family. Given a family's probe artifacts, each team brainstormed inferences about that family and then clustered the inferences by mapping each to a particular value. Teams were allowed to add new values in cases where they felt the Rokeach framework was insufficient.

We asked each team to cooperatively complete the Rokeach Value Survey, demonstrating their understanding of their family's value priorities. These responses were compared with the families' responses. We wanted to understand whether the families' value priorities were conveyed to the design teams through the probe artifacts, understanding that the probes and the survey are not interchangeable forms of data. The survey might have elicited a self-report bias and the probes would never be wholly unbiased in their own right. In addition, the Rokeach Value Survey was not a tractable task for children to be involved in, so although the children's values may have been reflected through the probe artifacts, they most likely would not have been weighted as heavily into the survey rankings.

The two design teams' interactions with the value probes and the Rokeach Value Survey were also observed by a member of the research team.

### Gathering Family Values Data: Results & Discussion

#### *Manifestations of Values*

In designing the probes, we had brainstormed ways that values might manifest themselves in everyday life. We created different probe activities to tap into each of these potential value manifestations:

- through how people spend their time,
- through how people would like to spend their time,
- through how people spend their money,
- through the things with which people surround themselves,
- through how people use their space,
- through how people portray themselves,
- through long-term goals, and
- through how people think about what is important.

Families reacted in different ways to activities tapping into different types of manifestations. The families responded with familiarity to day planner activities about how they spend their time and to the family photo album about how they portray themselves. Activities in which families were asked to think about what is important, such as the letter to one's children, elicited a response of anticipation — they understood how to think about their lives in that manner, but did not have the opportunity to think in such a way on an everyday basis. The families did not appear to be

| *Activity* | *Manifestation* | *Expression* |
|---|---|---|
| *Family Album:* Take turns posing Joe Bender™ (a bendable wire figurine) as yourself. Take a photo and add it to the family picture frame. | Through how people portray themselves | Intrapersonal, Bodily-Kinesthetic & Spatial |
| *Day Planner:* Recall your schedule today. Generate a day planner page to detail everything you did today. Generate another day planner page to detail what you would have done if today had been an ideal day. | Through how people (would like to) spend their time | Logical/Mathematical & Linguistic |
| *Milestones Memory:* Play a game of Milestones Memory, a card game that involves selecting five goals you'd like to achieve during your lifetime. | Through long-term goals | Interpersonal & Existentialist |
| *Map:* Draw a map of your house. Label the rooms. Annotate your map with stickers (e.g., best hiding place, best place to find help, scariest place). | Though how people use their space | Spatial & Bodily-Kinesthetic |
| *Letter to Kids:* Write a letter for your children to read twenty years from now. Reflect, for your children, on the lessons you would have liked for them to have learned. | Through how people think about what is important | Existentialist & Linguistic |
| *Budget:* Estimate your monthly budget. | Through how people spend their money | Logical/Mathematical |
| *Scrapbook:* Create a scrapbook that captures what you value in or about your home. | Through the things with which people surround themselves | Spatial, Bodily-Kinesthetic & Linguistic |
| *Recipe:* Compose your own recipe for a successful life. | Through how people think about what is important | Existentialist & Linguistic |
| *Invitation:* Design an invitation for a dinner party. | Through how people portray themselves | Interpersonal & Linguistic |

**Table 2. Value probe activities**

uncomfortable conveying their values through any of these manifestations. In contrast, both sets of parents appeared uncomfortable conveying their values through the Rokeach Value Survey. One set of parents, for example, devised a voting scheme to arrive at a compromise between the different rankings they each wanted to assign. In the end, both parents seemed unsatisfied and articulated that their portrayal through the survey still wasn't "right."

#### *Expressions of Values*

In considering the kinds of activities to include in the probes, we hypothesized that different families or family members might be most comfortable communicating their values in different ways. To account for this consideration, we looked to Gardner's Multiple Intelligences (e.g., logical-mathematical, kinesthetic) [5] and created activities that enabled people to communicate their values along these various modalities (e.g., by manipulating numbers, by manipulating physical objects).

In completing the probe activities, different families and different family members displayed the most interest in different activities. One family left the budget to the bitter end, hoping to come back to it, while the next family set everything else aside to pore over the budget's details. Providing activities in differing modes of expression seemed to draw on the energies and talent of a broader subset of participants.

#### *Not Only "What Is" But "What Could Be"*

We hypothesized that values might be conveyed, not only through *what is* (i.e., everyday occurrences) but through *what could be* (i.e., goals or dreams). We considered that many valid values might not be conveyed in the *what is* of everyday life. In the day planner activity, for example, we asked the families to complete two day planner pages — the first detailing what they did that day (*what is*) and the second detailing what they would have done had the day been an ideal day (*what could be*).

The families appeared comfortable thinking and reporting about *what could be*. In some cases, the families used this opportunity to drastically "rewrite" their lives. In other cases, the families actually "rewrote" very little of their lives, either reflecting that their lives "weren't really so bad" or emphasizing "if I just could fit this one other thing in, I'd deal with everything else, as is."

### Generating Value Inferences: Results & Discussion

#### *Triangulation & Reflexivity*

The process of creating value inferences was one of triangulation across probe artifacts and reflexivity between the probe artifacts and the emergent clusters of value

inferences. One design team, for example, arrived at a shared understanding that their family valued *broadmindedness* at a global level. The design team synthesized this understanding from four different inferences drawn from four different artifacts.

After generating initial clusters of inferences, one design team paused to look at the taxonomy of values on the table. They noticed a value, *capable*, without any inferences mapped to it. This prompted them to recall certain aspects of the artifacts they had originally overlooked that did, in fact, reflect that value. The team went on to generate additional inferences about the family's relationship to this value.

### *Inferences from "What Is" and "What Could Be" Accounting*

We had hypothesized that values might be conveyed both through *what is* and *what could be* accounting. In our data, there were an equal number of inferences generated by the *what if* artifacts and the *what could be* artifacts. This suggests that both types of accounting may be useful to designers in understanding the values of a family.

### *Interteam Reliability*

Substantial overlap existed between the inferences generated by teams that worked with the same family's data. It is impossible to directly compare quantitative results, however, because sometimes the two teams constructed different shared meanings of the various values. For example, one team mapped a set of inferences to *loving* while the other team had constructed *family security* to mean nearly the same thing. In the context of a design process, the different mappings would likely be acceptable, given that the collection of inferences mapped to any particular value will convey and contextualize the meanings that have been socially constructed and may be equivalently instantiated in concrete design proposals.

The strongest indicator of the consistency of inferences was that for one family, when the teams did not feel the Rokeach framework was adequate, both teams generated the exact same value to add to the table: *health and well-being*.

### *Serial Position Effect in Values Inference*

In the Rokeach Value Survey, the average difference between the design teams' ranking of a value's priority and the families' ranking suggested that values inference may exhibit a serial position effect. The design teams generally identified the values that the families rated as the most important and the least important more accurately than the values that the families rated as neither important nor unimportant.

## CONCLUSION

We have presented a narrow slice of a research agenda, the broader goal of which is to explore means of supporting a larger potential breadth of user values in domestic design [12]. We have focused here on one method for conveying values between families and designers — a methodological adaptation of cultural probes. With these initial results, we are optimistic about the potential of conveying a broader palette of domestic values to designers.

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