

Reflective Inquiries: a multi-dimensional approach to user research

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ABSTRACT

As focus in the HCI community continues to move beyond the office, a key challenge for interaction design researchers and practitioners is developing a reflective sensibility for understanding the *real* and situated complexity of everyday life. While HCI practice, as it owes to traditions of cognitive science and engineering, has been effective at extracting reproducible behavioural models and 'implications' to inform design for the workplace, these approaches are less helpful when applied alternate contexts, such as the home, to inspire design of *affective* engaging experiences. In this workshop paper we describe the methods and process of a *designerly* approach to multi-dimensional user research we employed to better understand the nuances of elderly families' everyday lives. We conclude with thoughts on what this type of approach suggests for *designing for engaged experience*.

Categories and Subject Descriptors

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

General Terms

Design, Human Factors

Keywords

Interaction Design, User Research

1. INTRODUCTION

As the field of HCI expands beyond the workplace, a key challenge for interaction design researchers and practitioners concerned with experience-centred design is developing a reflective sensibility for understandings the *real* and situated complexity of everyday life. Accordingly, alternative methods continue to be developed, used and appropriated to critically inquire into the rich subjective side of human experience as a means to, among other things, establish dialogical user-designer relationships, develop deeper levels of empathy, and inspire the design of *affective* engaging experiences [7]. The process through which designers grapple with the complex 'messiness' of reality and arrive at a final worthwhile design outcome has been referred to by many as *designerly* [e.g. 6]; and the uptake and treatment of reflective approaches to understand human experience in the design process can be seen as parallel to a more *designerly* way of approaching research and design in the context of HCI. In this workshop paper, we describe the methods and process of a *designerly* approach we employed to

better understand the nuances of elderly families' everyday lives at home. This multi-dimensional user research is part of a larger project exploring design opportunities to evoke feelings of social connectedness through ambient ubiquitous technology in the home—an area of particular importance for seniors, considering their social network typically begins to decrease as they age, putting them in risk of social isolation [1].

We conducted a series of studies to explore multiple dimensions of our subjects' experiences of everyday life. Specifically, we relied on approaches including (i) ethnographically-inspired *contextual interviews*, (ii) *participatory sketching exercises* [described in 4], (iii) *cultural probes* [2], and (iv) *technology probes* [3]. Based on the results of each of these studies, we increasingly focused on exploring the deeper social and emotional sides of domestic life; and the role interactive design interventions might play in supporting these aspects of domesticity. After generating numerous design ideas in line with this trajectory, we developed and implemented an ambient interactive prototype and conducted a technology probe study by deploying a pair of prototypes in two households. In what immediately follows we briefly describe each stage of this process and conclude with a brief discussion on what this type of approach suggests for *designing for engaged experience*.

2. STUDY 1: CONTEXTUAL INTERVIEW

To develop a deeper understanding of everyday elderly life, we conducted ethnographically-inspired contextual interviews with two couples (P1, P2). We initially drew on the notion of the *house as mirror of the self* [4] as a lens through which to explore how participants formed meaningful relationships with objects and spaces in and around their homes. Our interview process involved: (i) asking participants about their activities and relationships, (ii) touring participants' homes and documenting personal objects that they held deeply meaningful, (iii) observing participants sketching relationships among common domestic activities and objects, and (iv) posing general questions about their perceptions of non-digital and digital objects (with emphasis on interactive technology use).



Figure 1. Maps of domestic activities and objects

Sketching exercises (Figure 1) were helpful for engaging participants in reflection on their everyday activities and

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emotional attachments to objects and spaces. In particular, stories about cherished objects (e.g., souvenir, sentimental heirlooms, family pictures) often provoked longer discussions on familial histories. These exercises resulted in the creation of physical maps visualizing an ecology of social and material relationships that represented participants' daily domestic interactions.

From these initial user studies, we uncovered that, as expected, participants strongly valued their social relationships with family members; similarly, the most meaningful objects represented symbolic ties to relationships with family or familial contexts. Moreover, participants had largely integrated technologies such as such as the cell phones, computers, and emails, into their everyday domestic lives; and exhibited active physical and social lives. Collectively, these findings pointed us toward exploring opportunities for rich, affective interactions beyond the paradigm of healthcare assistance, which characterizes many of the traditional design interventions aimed at the elderly in interaction design and informatics.

3. STUDY 2: CULTURAL PROBE

Based on the foundation and trajectory established from our initial observations, we developed cultural probes [2] to reflectively explore how relationships and interactions among participants and their domestic environment connect to separated family members. Moreover, choice to use cultural probes was motivated by our interest in unobtrusively provoking our participants to consider their personal and emotional relationships with objects, places, and people. Specifically, we provided two elderly households (P3, P4) with diaries, disposable cameras, and an instruction sheet; after two weeks the probe packages were returned for analysis.

While both participants had a similar set of tasks to complete for the probes, their responses provided a variety of different outcomes. Pictures and responses from P3 tended to be more nostalgic and describe the histories of objects common to his everyday life, whereas P4 was focused more on practical aspects of daily activities. The pictures taken by P3 illustrated her interests in sharing memories related to awards received during diplomatic service, care for the nature and the environment, family activities, and common hobbies within the house. The pictures taken by P4 highlighted interests in collective family interactions and activities, wonders of natural and animal life in and around their home, heirlooms, and activities for self-betterment (e.g. yoga).

4. CONCEPT DEVELOPMENT

Through multiple analysis and ideation sessions, our design team explored and analysed all the probe data to identify common patterns or interesting idiosyncrasies. Both participants took a variety of pictures of their family and noted that they prefer to spend considerable amounts of time with their children and grandchildren whenever possible. Apart from family relationships, P3 exhibited growing a variety of vegetables and fruits in his house. P4 showed she maintains multiple bird feeders in her backyard that are visible from her breakfast table. Through interactions with the returned probed materials and subsequent discussions in our design sessions, two main themes emerged: *caring*—taking care of various project and family relationships—and *sharing*—relating memories, personal activities, and family information to others. Through two additional brainstorming sessions, we used these themes to

develop and categorize concepts to guide the design of a technology probe to further explore our evolving assumptions and ideas. We mapped each concept on the two dimensional axes of themes and interface, which allowed us to critique the potential benefits and drawbacks offered by each (Figure 2).

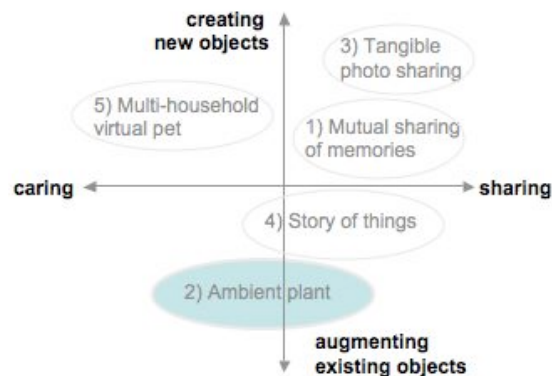


Fig 2. Conceptual dimensions of technology probe

While each of these conceptual ideas touched upon notions of our two themes, the ambient plant presented the most compelling case, offering strong potential to easily integrate into the domestic ecology and build on a common practice.

5. STUDY 3: TECHNOLOGY PROBE

Through the ambient plant pot, we aimed to explore ways in which feelings of social connection could be stimulated between separated family members and gauge participants' perceptions and orientations over time. The ambient plant senses local plant moisture levels and conveys this information as a colour produced by LEDs on a plant pot-based display (i.e. from red when a plant is dry to green when it is wet). A second display conveys the condition of the remote household plant, allowing members to visualize the state of their family member's plant. Additionally, when a participant is in close proximity to their plant, an integrated IR sensor causes the distant household's pot to begin to glow brightly, potentially stimulating curious reflection on the real-time activity of separated loved ones— notion owing to [5].

Each prototype was deployed to separate households—an elderly couple (P5) and their daughter (P6). We visited both of their houses, conducted a brief interview, and installed the prototype. In the first visit, we asked them about how they typically communicate with each other and where they would prefer to place the plant pot and why. Then we instructed them to use provided self-diary sheets to note their feelings whenever they see pot display changes and to write down any actions they do to the pot along with any responses from the pot according to their manipulation. We also instructed them to provide dates and times of all diary entries so that responses to the same event can be compared across participants. After two weeks, we visited our participants again to remove the prototypes, collect diary sheets, and ask participants about their overall experiences.

5.1 Findings

Both P5 and P6 reported that it was interesting to guess what was happening in the other house whenever the display changed. (P5: "I was almost sure my daughter is shaking hands to the plant pot." P6: "I can picture that my father was doing

something around the kitchen.”) P6 mentioned that it was good to feel connected just through sharing some atmospheres of their parents’ place without doing anything special, revealing this mode of affective interaction appears to be qualitatively different from engaging with static or asynchronous forms of communications, such as looking at photos, touching a device, or sending messages. Spontaneous enjoyable interactions also emerged as participants remotely played with each other by waving their hands in front of the plant pot to change the display colour as sensors detected their movements.



Fig 3. Ambient plant pots in participants’ households

The passive aspects of interaction, at times, seemed to evoke sincere reflection on what the others’ situation might be. Specifically, P5 described worry about intruding on the busy schedule of their children (“they are busy with their work. Their time is more important than ours”), and P6 also cares about their parents (“I cannot really visit them as much as I want.”), this indirect communication might make both of them feel more comfortable. Additionally, P6 compared the plant pot to other devices that she had tried: “I had presented my parents digital photo-frames before, but they do not use them at all. This pot feels like more absorbed in home because it does not have a screen. It can be refined not to look cheap by reducing the display size.” Additionally, the elder participants in the probe study mentioned that the interaction would be more valuable if they lived alone or very far away from their children.

6. MULTI-DIMENSIONAL STUDIES

We drew on several different reflective user research approaches to explore multiple dimensions of our participants’ lives and inquire into the nature of their experiences. By recruiting two households for each step of the studies (total 6 households, 5 elderly couples and 1 daughter), we tried to get a diverse range of rich feedback with a limited number of participants. Rather than focusing on discovering problems or extrapolating requirements to be applied to a general population, we employed a series of related exploratory studies to investigate new design opportunities; through these dialogical interactions we developed understandings of particular nuances of domestic elderly experience and refined our sensibility to *affectively* design for them.

In this context, contextual interviews emerged as a useful approach to obtain initial insights related to daily routines and domestic spaces; participatory sketching exercises emerged as a particularly evocative way to engage our participants in telling stories. The cultural probe study was conducted to further explore insights and flesh out assumptions developed during our participant observations. Finally, the ambient plant technology probe served as a catalyst to concretely provoke participant reflections on how ambient technology might fit in and affect their everyday lives in ways difficult to anticipate without *real* interactions and descriptions of experience. Collectively, knowledge from this approach suggested two specific design directions requiring further exploration, namely:

- *Augmenting familiar objects and activities with ambient technology.* Considering elderly participants’ dense domestic ecology and cognitive or physical requirements, we augmented a common, familiar object (plant pot) and practice (nurturing plant) with socially relevant ambient information. The introduction of this probe opened a space to explore how subtle uses of ambient technology can enrich everyday interactions—particularly with respect to the relationship between digital and material qualities embodied in tangible interactive artefacts.
- *Leveraging passive and ambiguous interaction to provoke sociability.* Passive aspects of interaction with the plant pot was one of the most significant differences compared to other ambient devices such as photo-frames or screen based and communication-focused interfaces. Sharing contexts through usual activities (e.g. water the plant pot) and displaying participants’ status in ambiguous ways may lead to interactions that afford more autonomy for users to decide either to engage with ambient feedback or to ignore it.

7. CONCLUSION

In this workshop paper we described a multi-dimensional approach to user research aimed at producing rich, reflective textures of our participants’ experiences of everyday life. Rather than triangulating user feedback for objective outcomes, this approach, in spirit and ambition, is about generating understandings—and relationships with—particular subtleties and nuances of experience as a means to practically inform and inspire design opportunities in a way useful to designers. As HCI continues to move into—and de facto embrace—the fuzzy, messy, and relationally complex contexts of everyday life, it is equally important appropriate ways of framing and grappling with such phenomena are rigorously employed—particularly if we are to effectively, and *affectively*, design for engaged experience.

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