Perspective Probe: Many Parts add up to a Whole Perspective

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Abstract

This case study describes a variation of cultural, technology, and other probes, called a "perspective probe." The perspective probe consisted of multiple activities that participants completed on their own and then discussed with the researcher. The participant's responses to the individual activities added up to their whole perspective. The probe's activities helped guide the conversation around a sensitive topic instead of asking directly about it.

This paper illustrates how the perspective probe methodology was used to gather information for Google Finance. The focus is on the method rather than the particular findings from the study. The perspective probe methodology was useful in getting rich data from participants and building a holistic understanding of the participant's perspective on a difficult topic, in this case money and investing.

Keywords

Cultural probe, probe, HCI.

ACM Classification Keywords

H.5.2. Information interfaces and presentation (e.g., HCI): User Interfaces (Evaluation/Methodology, User centered design)

Introduction

Bill Gaver and a group of designers developed cultural probes in the EU Presence Project [1, 2, 3] as a reaction to having geographically dispersed team members and being unable to embed themselves with the target population for a long time. "Cultural probes are designed objects, physical packages containing open ended and oblique tasks to support early participant engagement with the design process" [4]. This method has inspired others in the HCI and design communities to augment and modify cultural probes to suit a variety of needs and topics. The method has been adapted in many different ways that Boehner et al describe in "How HCI interprets Probes." [4]

This paper describes our variant of the cultural probe called the perspective probe. Perspective probes share some characteristics of other probes:

A. Rapid data is desired. As Paulos and Jenkins note, cultural probes are "often used early on in fields where broad and rapid data is desired" [5, p. 342]." In our case we were working with a product team that needed data as fast as possible in order to begin designing.

B. Topic that people do not normally reflect on. Kuiper-Hoyng and Beusmans [6] and Battarbee et al [7] describe how they used probes to get people to reflect on their daily lives. Kuiper-Hoyng et al used probes to help people to become aware of everyday activities and to express their emotions. Battarbee et al used probes to more deeply understand "meanings, values and experiences people associate with different kinds of contemporary domestic technology"; the activities helped to explore beyond stereotypes about products and their meanings. Crabtree et al [8] used probes to understand the needs of former psychiatric patients and elderly and disabled people living at home. In our perspective probe, we explored the sensitive and not frequently considered topic of investing.

C. Collect information rather than inspiration. Hemmings et al [9] describes using probes to collect "contextual ethnographic information unobtrusively from a socially sensitive setting." Our focus was to collect information from various angles to understand participant's views in order to inform feature design.

D. Use artifacts to help conduct interviews. The artifacts that participants created have been used to help conduct interviews or use interviews to follow up on probe results [6, 7, 10]. We used the artifacts as conversation starters during a follow up phone call.

E. Holistic understanding. Mattelmäki and Beusmans [11] used probes to build a "holistic understanding" of people who exercise for wellbeing. We also used the probe activities to form a holistic view of the participant's perspective towards investing.

F. Turning findings into design decisions. Amin et al [10] used probes to discover four important aspects of SMS communication for teenagers. In this case study we turned the findings from the probes into actionable design guidelines for the team.

The perspective probe is unique from other probes in two ways. First, a perspective is a person's point of view based on a particular set of beliefs, that manifests itself in how the person responds to and makes sense of experiences. With the perspective probe, we are collecting the responses to experiences in order to

understand the person's point of view and overall belief system about a particular topic. Through the perspective probe we were seeking to build a holistic understanding by breaking down the larger, hard to access belief system on a topic into a series of activities that each contributed a piece of the puzzle. In aggregate the data from all the activities painted a picture of the participant's perspective (Figure 1).
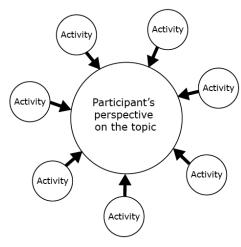

Figure 1. Each activity contributed a piece of knowledge that added up to a whole understanding of the participant's perspective

Second, the probe packet allowed the participant to share their context with the researcher before the follow-up phone call. The activities gave participants the opportunity to organize their thoughts, select what they wanted to share, and know ahead of time what topics would be discussed. Through the artifacts they sent back, the researcher and participant had

established a shared context, obviating the need to establish this context during the call; the experience of completing the activities built trust before the phone call made them more comfortable in revealing personal information during the call.

Background
We were working with the Google Finance team to better understand how people view investing, how they use their online portfolios as part of their other investment tools, and uncover opportunities to improve Google Finance. The topic of money is considered a sensitive one in the United States, and we had found in previous field visits that much time was spent building rapport before participants were comfortable enough to reveal personal information, if at all. We had also found that this is not a topic about which people have ready answers and need time to formulate their thoughts. An alternative methodology to in-person field visits or interviews that would make participants' feel comfortable quickly and generate rich data about the sensitive topic of investing was needed.

We chose to create a variation of a cultural probe, which we called a perspective probe. The perspective probe involved having participants complete several activities on their own and then participate in a debriefing phone interview to discuss the artifacts they had created. This type of probe helped us explore each participant's perspective on the broad area of investing rather than get an answer to a particular question.

The perspective probe addressed the challenge of collecting rich data about a difficult topic. The probe produced deep insights about the sensitive topic by breaking it into pieces and having each activity add to

the larger picture of the participant's perspective on the topic. We designed the activities to each shed light on a part of the larger topic, which taken as a whole would allow us to triangulate and understand a participant's perspective on a topic area. The activities produced rich visual and oral data through participant-generated diagrams, categorizations, and writing, as well as interview answers.

Method

We recruited 16 participants across the United States who used online portfolios either at their brokerage site or sites such as Google Finance - that allow users to track financial information. Among the latter group we had a variety of those who tracked their transactions online and those who did not. The study took 5 weeks to complete. Figure 2 shows the main steps and their timing.

Study Timeline by Week

Week 1	Recruit participants, design activities and supporting artifacts
Week 2	Pilot and refine activities. Assemble packets and send to participants
Week 3	Participants complete activities and return packets
Week 4	Debriefing phone calls with participants
Week 5	Data analysis

Figure 2. Study timeline

Designing the Activities

There were several aspects about the investing topic that were of interest to us, and we focused the activities around these aspects. To develop the activities, we made a list of questions that we wanted to investigate, and then brainstormed activities that would reveal something interesting about that aspect. Here is the list of activities, the questions that they were based on, and the associated activities we created.

ACTIVITY 1: "DRAW YOUR FINANCIAL LIFE."
Research question: What items comprise their financial life? What tools do they use?

Activity: Participants were given an 11x17 piece of paper and instructed to draw the important items, tools, and flows that make up their financial lives. (Similar to the method that Adams described [12])

ACTIVITY 2: "LETTER FROM THE FUTURE"
Research question: What are people's financial goals?

Activity: Participants were asked to write a letter to their present selves from their future self who had accomplished their financial goals, telling them what they've achieved and how they got there.

ACTIVITY 3: "PORTFOLIO DEFINITION"
Research question: What is included or excluded from their portfolio?

Activity: Participants completed a dictionary definition based on their own view of what a portfolio was.

ACTIVITY 4: "GUIDED TOUR OF YOUR PORTFOLIO" (FIGURE 3)
Research question: How do they currently use their online portfolio?

Activity: Participants filled a museum tour booklet of their portfolio and took photos of highlights on the tour. They covered private information with the provided sticky notes.

Figure 3. Activity 4: Guided Tour of Portfolio

ACTIVITY 5: "TEAMS OF INVESTMENTS"
Research question: What categories are important in their investments?

Activity: Participants completed a booklet of "teams" (groups) of investments that they had in their portfolios. They named each team and listed its members.

ACTIVITY 6: "PORTFOLIO REPORT CARD"
Research question: How do they evaluate their portfolios?

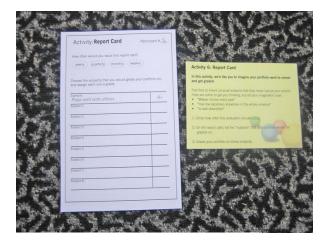*Activity*: Participants listed "subjects" on which to evaluate their portfolio and then graded it.

Figure 4. Activity 6: Portfolio Report Card

ACTIVITY 7: "PHOTO CHECKLIST"
Research question: What else is important?

Activity: Participants were given a checklist of open ended items to take pictures of to show their environment – such as where they keep track of investments, good sources of information about investing, etc.

Figure 5. Activities and instruction cards

Each participant was shipped overnight a packet containing:

- Welcome letter
- 7 activities with instruction cards (Figure 5)
- Low end digital camera with built in memory
- Sticky flags and sticky notes to cover private information
- Mailing label to return the packet

Retention

Eleven of the sixteen participants completed the study. One participant dropped out before receiving the packet. One participant dropped out after receiving the packet and reported feeling uncomfortable with completing the activities; we suspect that he felt the topic was too sensitive. Three participants did not return the packets and gave no reason; despite follow up phone calls we were not able to reach these individuals to learn why they did not complete the study. The completion rate is on par with other methods such as diary studies, that require participation over more than one session.

Each participant received a phone call to make sure they received the packet and to answer any questions that they had. The participants had approximately 7-10 days to complete the activities and to mail back the package. Several of the participants forgot to mail the packets on time, so we recommend a follow up phone call to remind participants to mail back the packets in time for the interview.

However, two participants, realizing that their packets would not arrive in time for their scheduled phone call, created digital versions of the activities and emailed them to us as PDFs (Figure 6). We were impressed with the creativity that these homemade activities showed and indicated how participants got into the spirit of the study.

Figure 6. Homemade digital version of a portion of one participant's Activity 7

Digitizing artifacts and debrief phone calls
After we received the packets from participants, we took digital photos of each artifact that they had sent back. We used screen sharing software to look at their artifacts with the participant during their 60 – 90 minute debrief phone call.

During the phone call we used the artifacts as conversation starters about the various aspects of portfolios (Figure 7).
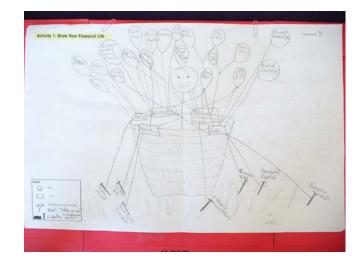

Figure 7. One participant's completed Activity 1

We could probe on topics of interest that emerged. We had begun rapport building before the call through having had communicated through the activities that they had completed. As a result, there was little need to spend time during the phone call to build rapport, so we could immediately jump into the substantive details.

Analysis and outcomes
For the main analysis session for the study, we held a team workshop. We had previously held similar analysis workshops thus team members were familiar with the format. Engineers, product managers, interaction designers, and customer support staff attended the session. Before the workshop, each attendee was given a participant's packet and transcript of the phone call, and asked to complete a one page summary from a template we had prepared. During the half day workshop the team first reviewed the summaries for

the other packets they had not seen and noted insights, facts, and ideas on sticky notes. Then we created an affinity diagram from the sticky notes. The team left the session with empathy of how people think about investing and how they use their portfolios. Because the data for each participant was so rich and complex, another half day analysis session was needed to identify themes - which we then turned into design principles. We looked for patterns across individuals' holistic perspectives, rather than analyzing across each activity.

One theme that emerged was that at a high level participants' financial concerns are similar, but the specific way that each participant dealt with this concern varied greatly. For example, concerns we heard repeated included not needing to worry about finances in the future, making sure the portfolio is growing, having enough money for retirement or child's education, not reacting to market fluctuations, being aware of short/long term capital gains, and not having debt. However, we heard a variety of strategies about how to accomplish these in terms of how often portfolios should be checked and managed, as well as a diversity of definitions of "diversification" and comfort levels with how diversified their portfolio was.

Lessons learned about the methodology

We learned about when it is appropriate to use the methodology, the benefits of having structured activities in the study, and also about having multiple activities.

When to use
The perspective probe method is an indirect way to ask around a topic in order to emerge with a holistic

understanding of a participant's perspective on that topic. It is particularly well suited for

- topics that are sensitive in nature, such as investing in this case
- when participants do not have well formulated thoughts on a topic
- when participants need time to consider what their perspective is, or when participants are not comfortable being observed

The probe does rely not on the co-presence of the researcher and participant; the participant has the freedom to interpret the activities as they like and answer with whatever resonates most with them. Since the goal is to understand each participant's perspective, it is not important that each participant interpret the activity in exactly the same way, as long as their response is in the spirit of that activity. Whatever artifacts they created served as conversation starters during the debrief phone call; the content of the artifact expressed whatever was most important to them. The activity's artifact was considered a success if it revealed something about the topic that was significant to the participant.

The perspective probe produced rich data about participants' environments. It can be explored in the future as a way of "dipping one's toe" into exploratory research before conducting research in the field – such as before embarking upon costly and time consuming research internationally.

Although this particular study was not focused on generating data to create personas, the depth of the data for each participant that was produced indicates

that it could be used for persona creation. In this study, the participants represented a wide range of ages and financial life stages, so there was not enough representation of any one group in order to identify characteristics for a persona.

Activities
Having received the packet of activities and interacting with it began the rapport-building between participant and researcher long before they talked on the phone for the debrief interview. Each came to the follow-up phone call with a familiarity with the other and was better prepared for the conversation. This allowed for a deeper conversation during the phone call, since trust has already been established. The bulk of the time during the call could then be spent exploring topics more closely instead.

Also, Also, several participants said this was more fun than other interviews they've participated in, indicating that they were more engaged. Overall they were motivated to share their experiences via these more whimsical activities rather than answering a series of interview questions.

Benefits of Multiple Activities
We found that there were benefits to having multiple activities. First, because the activities were specifically tailored for this study and therefore not conventional, there was a risk that it might not produce the desired data. This allowed for experimentation with different activities and we did not rely on any one activity to produce THE answer; the value lies in the compositing of all the participants' responses across activities. Having multiple activities hedged the bet across all activities, even if one turned out to be a letdown. In

fact, one activity - the Portfolio Definition activity did not produce many meaningful insights.

Second, the activities were indirect ways to access the topic that we were interested in. Having multiple takes on the topic allowed us to triangulate our understanding of the participant's mental model and perspective.

Finally, since the participant completed each activity on its own, we found that contradictions within their thinking were revealed as people did not strive to weave a consistent story across the activities. The contradictions also pointed to gaps in knowledge and understanding about investing and that they didn't know what they didn't know.

Conclusion
The perspective probe builds on the history of using probes for human computer interaction research. The technique involved having participants complete several activities - designed specifically to uncover significant aspects of the research topic - on their own, and then participating in a phone call with a researcher. The activities broke down the difficult and sensitive topic of investing into small pieces. The total of the activities provided a holistic understanding of the participant's perspective on investing by approaching it from different angles in the activities. The activity preparation work produced richer data for the phone call than a regular interview; rapport has already been built through the initial communication of the activities and then artifacts served as conversation starters to immediately get deeper. Also, participants reported the activities were fun and we observed that they were quite engaged in the study as a result.

Acknowledgements

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