Interview Viz:
Visualization-Assisted Photo Elicitation

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Abstract

This paper describes a novel variation on an established social science research method, photo elicitation. We developed two visualizations of large numbers of cameraphone images, by time and sharing partner. The result was much richer and more detailed interviews than would have been possible otherwise. This method may be appropriate for other user studies where photo diaries are useful, and can be implemented using available photo organizing applications.

Keywords

Photo elicitation; diary studies; photo diary studies; photographs; qualitative methods; user studies; visualization; cameraphones;

ACM Classification Keywords

H5.1. Multimedia Information Systems: Evaluation/Methodology

Introduction

As HCI incorporates more user research, field studies, and ethnographically-informed data collection, the field is paying increasing attention to finding and developing appropriate methods of data collection. An enduring problem with interviews as a research method is the

Photo Elicitation

Photo elicitation uses photos in conjunction with interviews to guide the interview, stimulate memory, or instigate conversations about a particular subject. It was developed in anthropology where it was used by researchers as early as Franz Boaz, but it is generally associated with Collier [4]. Harper [5] is an overview.

Photos of any kind from any source may be used, depending on the goal of the research. In *reflexive* or *participant-driven* photo elicitation, interviewees themselves generate the images, usually on a specific topic at the request of the researcher.

Carter and Mankoff [6] summarize a number of photo elicitation studies and conclude that the method is helpful for getting detailed information about participants' everyday lives, and helping them focus on the interview and make new associations. Participant-driven photo elicitation generally gets even more detailed answers than research using externally-generated images, because the images have personal meaning to the participants.

Photo Diary Studies in HCI

Diary studies are commonly used in marketing and in social science research into daily activities. Diary tools that have been used in HCI include paper, voice-mail [7] and cameras [6, 8].

Carter and Mankoff [6] report on three diary studies, two of which included photo diaries. In one, they gave 11 participants small digital cameras and asked each to take a picture every time they consumed or produced information during one entire day, followed by interviews about the images. In the second,

potential slip between reality and retrospective accounts. When participants are asked to recall their actions, intentions, or understandings, their memories may be incomplete or inaccurate. They may give shortened or simplified accounts of complex events or reasoning. And their reports may be influenced by their perceptions of researchers' expectations.

One alternative is to use traces of people's activities such as system logs. Of course, often what's available is not what's needed. Another is to ask people to record their activities: diary studies. While useful, diary studies can interfere with the activity being studied: the record-keeping may interrupt the activity; self-consciousness may interfere with the phenomenon studied; or the records may be too brief, incomplete, or inaccurate, since they place burden on the participants.

We describe here a method we are calling *Interview Viz*, a form of photo elicitation, a method developed in anthropology. We use digital-image-based technologies to ground interviews in large numbers of images (hundreds and even thousands of images in a single interview) presented in several different arrangements (by date and sharing partner) with the ability to zoom in on specific images or out to see patterns. This paper is about this *method*, not the visualization tool nor our findings. The larger project, including research questions and findings, is described elsewhere [1, 2, 3].[1]

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[1] The Project website is http://www.sims.berkeley.edu/~vanhouse/photo_project/index.php

participants recorded their information-related events during a day at a jazz festival. Different people were given different recording media; two were given digital cameras. One of Carter and Mankoff's goals was to compare different diary capture methods. They found that, of the methods tested, photos were the easiest for participants to capture and later recognize.

Brown et al. [8] asked 22 participants to take photos whenever they felt the need to "capture" information over seven days. Kindberg et al [9, 10], in a study of cameraphone use, asked 34 participants to show them a random set of five images currently on their cameraphones. They then asked about the content, reasons for taking, and uses of each image.

These short time periods and/or small numbers of images are not unusual in diary studies of all kinds because of the burden of data capture on the participants, but it raises questions about the representativeness of the data and novelty effects. One goal for new diary study tools and methods would be to reduce the intrusiveness of data collection.

Our Study: Interview Viz

Our decision to use photo elicitation was an outgrowth of the development of the MMM2 system [11] and our studies of its users [1, 3]. The MMM2 system, in brief, automatically uploaded cameraphone images to an internet-based photo organizing and sharing system. We gave MMM2-enabled cameraphones with free voice and data service to 70 people for up to 10 months. Forty were master's students in the School of Information Management and Systems (SIMS). Of the total group, 42 became regular users (capturing at least 13 images, with 30 days or more between their first and last images; and/or a daily average of at least 0.33 images).

Each MMM2 user had a personal web space that displayed his or her cameraphone images. Images could be shared via the MMM2 system with anyone with an email address; these shares were logged. Sharing could also take place outside MMM, e.g., via email; these were not logged.

The technical team developed a visualization that displayed images by date taken. The user research team immediately saw its value and asked for changes to make it useful for photo elicitation.

We then used the visualization to interview users about their image-taking and sharing activities and intentions. Our study differed from most diary studies in that we did not drive data capture; images were created by users for their own purposes. The length of time over which images were collected, 10 months, was also exceptional. To date, we have used this visualization to interview ten "regular" users (as defined above), all SIMS Master's students, three women and seven men. Their average age is about 30. The number of images they had taken and uploaded to MMM2 ranged from 35 to 2973; the median was 747. Their mean images taken per day ranged from .37 to 8.17, median 2.31.

We viewed with them all their images captured over the length of the study, using the visualizations showing patterns of activity, and then asking more detailed questions about images selected by us or the photographer as particularly noteworthy – usually as representing a type of image or capture event. Our

[Interviewee looking at an image she thought she had shared but hadn't] "I always shared via MMM...Maybe I just shared one? [Sounding surprised] Huh! I could have sworn...Hmmm."

[Interviewee looking at how many more images she had received than sent] *Laughing*, "I'm not much of a giver, am I?"

[Looking at a day with a large number of photos captured] "That's when I was bored in a meeting....Yes, I generally take pictures when I'm bored...I guess it's something to do....I *share* a lot of pictures in meetings...I'll be on Instant Messenger with X and..." [send him a photo].

[Looking at pictures taken in an airport and shared with several people] "I sent a lot of people pictures from the airport because I wanted to say, 'Hey I'm in Minneapolis, here I am, on vacation, not in Berkeley -- relaxing.'"

(organizing, printing, archiving them elsewhere, and so forth); and their overall reactions to both the cameraphone and the MMM2 system.

The visualizations are shown in Figures 1 and 2. Figure 1 shows images along a timeline. Each column is a day, and each square is a thumbnail of an image taken that day. The start and end dates can be selected, and the viewer can scroll along the timeline. Figure 2 shows images shared using the MMM2 system. Each row is a sharing partner. The top part of Figure 2 shows images shared, arranged by recipient. The bottom part showed images received, arranged by sender.

To protect the privacy of the photographer, people in the images, and recipients, the visualization offered thumbnails of 25, 50, or 200 pixels. At the smaller resolutions, the photographer could generally recognize content but the researcher could not. The interviewee could click on an image to blow it up to a full screen. The sharing screen (Figure 2) listed only first names.

The Benefits of the Viz Interview Method

Viewing and discussing the images using our visualizations had many advantages over simple interviews. First, the images generally resulted in more, and more detailed, information about the participants' activities. Whereas simple interviews often elicited short, generalized answers, the images spurred detailed accounts of specific pictures, picture-taking events, sharing events, and sharing partners. This is a form of critical incident method, with the ability to identify and discuss many such incidents.

Second, the evidence sometimes refreshed or contradicted the participants' memories, confirming our
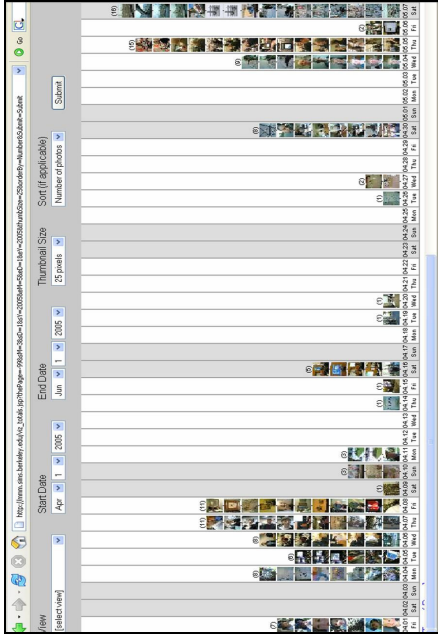

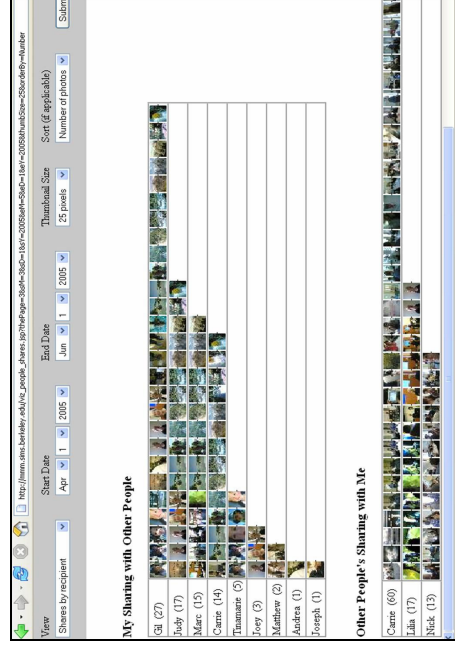Figure 1. Visualization of images over time.

Figure 2. Visualization of images shared, by recipient or source.

questions addressed the kinds of pictures participants took, and why; which images they shared, with whom, how, and why; what else they did with the images

expectation that we would get more accurate reports [See box].

Third, because we could view large numbers of images at once, patterns of which the photographers themselves were sometimes unaware became apparent [see box]. The time dimension made temporal patterns visible, about which we could then ask participants. For example, most picture-taking seemed to follow two patterns overlaid: periodic bursts of picture-taking, shown as peaks on the graph, indicating photo-worthy events; and a low but relatively continuous level of picture taking, one, two, or three images a day, a pattern of life-chronicling which is unique to cameraphones, a result of their continual availability.

We could also ask about lacunae in picture-taking. Many suspended image-making for a week or two at the middle of the semester – participants said they had several major assignments due then. Image-making was greater when they had more leisure time.

The sharing visualization revealed clusters of shared images and of recipients. Even when researchers could not to distinguish the content, the color values and patterns of the thumbnails revealed images shared with multiple recipients. Photographers tended to share differently with distinct, non-overlapping groups.

In sum, photo elicitation – in this case about the photos themselves and photo-taking and sharing activity – was useful in getting detailed reports on activity, in correcting memory lapses, revealing patterns of activity, and suggesting other findings that we could then explore with the participants. Viewing the images with the participants gave us details and meanings that

we could not have developed on our own, but the thumbnails preserved confidentiality.

Other Uses in HCI and Beyond

Studying people's photographic behavior is, of course, an important use of this method. Most research on personal photography uses selected subsets of images such as photo albums which likely represent only a small and heavily biased portion of a person's photographic activity. With this method we can study a large number of digital images created over a long time, getting a more encompassing view of a person's digital photographic corpus and activity.

This method could be used for HCI research in a variety of areas where photo diaries would be useful for tracking activities, events, or interactions, not just photographic activity, by giving participants cameras with which to record activity and then using the visualization for interviews. For example, a study like Carter and Mankoff's [6] might use this method to discern patterns in information sources and events.

Researchers could use existing photo organizing applications for this purpose: Adobe® Photoshop® Album, Picasa™, and Flickr™ are among those that can display large numbers of digital images by date, although none of these has as detailed a view as ours.

This methodological development also shows how information technologies can be used to innovate in social science research methods. In this case we're using a fairly simple technology. With more collaboration between technology designers and social science researchers, more sophisticated technologies

for capturing and representing activity could be of great use in empirical social science research.

We expect to continue to use and refine this method in this and other studies of photographic activity and technology. We have scheduled more photo elicitation interviews with MMM2 users. We also plan future research on photo-sharing and multimodal communication using all kinds of images, not just cameraphones; we expect to adapt this visualization to use digital images of all kinds. We also plan to test the value of Flickr™, including its visualization of images by date, for similar interviews.

Acknowledgements

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