Ethnography

9

9.1 INTRODUCTION

You've just been offered a fantastic opportunity to become involved in the design of an innovative new health-care information management system, to be used in hospital intensive-care units in a country that you've always wanted to visit. Your job is to design an integrated set of user interfaces, based on a detailed understanding of system requirements, organizational concerns, work practices, and a multitude of other relevant factors.

As soon as you accept the job, you realize that you've got a big problem: where to start? How should you go about developing an understanding of the situation that you will need to design these interfaces? You've never worked in a hospital—let alone an intensive-care unit—so you know almost nothing about how the people work, what information they need, how they want it displayed, and other factors that will be crucial elements of your designs.

This lack of background would be hard enough if the hospital was in your neighborhood, as you might be able to rely upon shared cultural background and perhaps even acquaintances to help you get started. However, you might find that the world of the hospital workers is very unfamiliar. If you haven't worked in that environment, the language, types of interactions, and values might effectively amount to a distinct subculture. Tackling these questions in a foreign country, with different social norms and work practices, seems much harder.

Whether in your home country or somewhere far from home, you should start by realizing that differences between cultures can be very important. An understanding of the ways that people work and interact is crucial for your success in designing the tool: assuming that your users are "just like you" might be a recipe for failure. How can you understand how people work and what they need from a computer system when you have almost no understanding of the context in which your designs will be used?

You might start by considering some of the other research techniques described in this book. Your first thought might be to consider surveying potential users. A survey containing questions about reactions to current information systems and hopes for future versions might help you build some initial understanding. Unfortunately, there are problems with this approach: not only do you not have much idea of which questions you should ask, you don't have much of an idea of how to ask them. You're

also a bit concerned that your questions might fail to address certain key issues. Interviews might help, but they suffer from similar problems. Talking directly with potential users might be helpful, but is also prone to potential omission of important topics. Besides, you don't know if your questions would be culturally appropriate— you don't want to offend anyone.

Having reached this point, you might (perhaps not so reluctantly) conclude that you need to take a trip to observe workers in this environment in person. You decide to learn what you can about hospital workplace practices and general cultural background that will help you understand how things are done "over there." You talk to your clients to identify a hospital where you can observe potential future users working in the intensive-care unit. You ask them if they can introduce you to a trusted partner who can show you around. You talk to this person to get some basic understanding. You then observe the health-care workers in action and talk with some of them in detail. You might spend several days "shadowing" some of them, following them around as they attend to various tasks and concerns.

As you go through these various steps, you begin to understand how these professionals work and what they need. You use this understanding to begin working towards lists of requirements and elements of proposed designs. As time goes on, you'll discuss these artifacts with your potential users, looking to them to either approve your suggestions or to suggest revisions that might correct misperceptions. As your ideas become more fully developed, you travel to another hospital in a different city to determine whether or not your ideas are appropriate for this second group of users.

This combination of observation, interviews, and participation is known as *ethnography*. Ethnographic research projects use deep immersion and participation in a specific research context to develop an understanding that would not be achievable with other, more limited research approaches.

This added insight does not come without a substantial cost: ethnographic research can be very challenging. Participation in a specific context can help you understand how to build tools for that situation, but effective data collection requires well-developed skills in observation, conversation, and interpretation. Ethnographers must take significant care in deciding with whom they should be talking and how to reconcile contradictory data.

This chapter provides some background on ethnography and its use in human-computer interaction (HCI) research. We discuss the steps involved in an ethnographic research project: selecting groups to study, choosing a form of participation, making initial contact, building relationships within the group, iterative data collection and analysis, and reporting results.

We discuss the use of ethnography in a variety of HCI projects, including examples from homes, workplaces, schools, and online, with a goal of understanding when it is appropriate for HCI research and how it might best be conducted. Although one chapter in a textbook is obviously no substitute for years of ethnographic research experience, we hope to provide an introduction that helps you make the most of this powerful technique.

9.2 **WHAT IS ETHNOGRAPHY?**

One social scientist defined ethnography as "the art and science of describing a human group—its institutions, interpersonal behaviors, material productions, and beliefs" (Angrosino, 2007). At first reading, this definition may seem somewhat unsatisfactory. After all, many forms of research might be used to develop a description of a human group—we might do surveys, conduct interviews, observe activities, and use other approaches described in this book (and elsewhere). Later in this chapter, we see how these research methods are important parts of ethnographic studies. So, what's so special about ethnography?

Ethnography, as a research methodology, has its roots in anthropological studies of non-Western cultures. In attempting to develop deep understandings of unfamiliar civilizations, researchers found that limited interactions and observations were insufficient. Moving beyond these limits required stepping out of the role of dispassionate observer and engaging directly with people in their daily lives. Anthropologists spent years living and working in traditional villages and using this deeply embedded perspective to provide insights that would have been difficult, if not impossible, to get from other data collection methods. This form of participatory research evolved into what we currently call ethnography (Angrosino, 2007).

Ethnography is based in the notion that true understanding of complex human practices and contexts requires in-depth, engaged study. Individuals often describe what they do in a way that is not accurate. This may be due to a lack of awareness or understanding of what they are doing, or individuals may report more socially acceptable actions than their actual actions (Blomberg et al., 2007). In Section 9.1, we saw how some research methods were inadequate for developing an understanding of a thoroughly unfamiliar environment. The proposed solution was to become immersed in the problem, spending significant amounts of time in the working environment, talking with the medical staff, watching how things are done, and learning from being in the world that is being studied. A core belief in ethnography is that "to gain an understanding of a world that you know little about, you must encounter it firsthand" (Blomberg et al., 2007).

Participation—in some form—is a critical practice in ethnography. Although researchers may not realistically be able to act exactly as if they belong to the group being studied, they try to be as involved as practically and ethically possible. Anthropologists conducting ethnographic studies of traditional societies live in these communities for several years, using participation in the activities of daily life as a means of understanding the dynamics of the group being studied. Section 9.4.2 has a more in-depth discussion of possible types of participation in an ethnographic study. Qualitative methods that involve no participation or observation, such as content analysis and document analysis, are presented in Chapter 11. The focus of this chapter is on traditional ethnography research, which involves some level of observation or participation.

As a descriptive technique, ethnography is usually *inductive*, moving from raw data to the identification of patterns that regularly occur in the data and, often, on to

general theories that explain the patterns. This inductive focus stands in direct contrast to hypothesis-driven research, which defines a narrowly controlled experiment to test well-defined alternative explanations or designs (Angrosino, 2007). There are no controls in ethnography—every case is unique.

Although ethnographies are similar to case studies (Chapter 7), there are some important differences. Like case studies, ethnographies rely on multiple types of data to confirm observations, a process known as triangulation (Angrosino, 2007). Ethnographies and case studies are both time intensive, personal, and largely based in the context being studied (Angrosino, 2007). The context often differentiates these research methods from methods such as surveys, experimental design, and other methods. In ethnography, context often is the main focus of understanding.

The primary difference between ethnography and case-study research lies in the use of theory. Case-study research is often based on hypotheses or propositions that guide the questions being asked. This theory-driven approach is subtly different from the inductive strategies used in ethnography.[1] Informally, you might think of an ethnographic study as being a very preliminary, exploratory case study.

Ethnographic research also differs from case studies and other qualitative research methods in the extent of the engagement with the group or situation being studied. The goal of ethnographic participation is to come as close as possible to achieving the rich perspective that comes from being part of the group being studied. Although this is rarely, if ever, possible (see Section 9.4.2), ethnographers tend to become deeply involved with the groups or situations that they are studying. Unlike case studies or other qualitative research projects that may use observations, interviews, and a similar range of data collection techniques in a relatively constrained manner over a short period of time, ethnographic research generally makes more fluid use of these techniques over a longer term, in close interaction with participants. In ethnographic research, the distinctions between "interaction," "interview," and "observation" are almost nonexistent, with all of these activities potentially occurring in the space of a few minutes. Of course, these somewhat arbitrary distinctions exist along a continuum with no clear boundaries: a long-term, highly interactive case study may be hard to distinguish from an ethnographic study.

One final note in defining ethnography: traditionally, the term "ethnography" has been used to define both the practice and the written outcome. Thus, ethnography is both a process and the outcome of that process. Like case studies, ethnographies are often narrative, telling the story behind the context being studied (Angrosino, 2007). Often, these stories strive to convey perspectives of the people being studied: giving "accounts of an event like community members do" has been described as an important ethnographic goal (Agar, 1980).

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[1] The role of theory has been the subject of much debate in ethnographic circles. There are numerous theoretical perspectives on ethnography (Angrosino, 2007). Some viewpoints reject the notion of ethnography as a tool for developing theories, claiming that it is (or should be) merely descriptive. This perspective has generated substantial discussion (Shapiro, 1994; Sharrock and Randall, 2004).

9.3 **ETHNOGRAPHY IN HCI**

The description of ethnography as the practice of using some form of participation in a group to develop an understanding of the group is straight from social science research. Social science ethnographers spend time living in traditional villages, hanging out on inner-city street corners, and otherwise immersing themselves in unfamiliar settings to understand the dynamics of groups of interest.

As fascinating as this might sound, it may also seem a bit far removed from research into HCI. After all, HCI researchers are usually trying to understand how to build systems or how users interact with computers. How does this relate to the in-depth study of groups and why is participation useful and helpful?

The connection becomes clearer once we consider the use of modern computer systems. Even when we are sitting in front of a traditional computer, conducting seemingly familiar tasks such as word processing, we're not really computing so much as we are communicating. Much of our computing work that does not directly involve communication or collaboration (e-mail, instant messaging, online calendars, virtual worlds)—involves creating artifacts (documents, spreadsheets, presentations) that communicate ideas to others. Mobile and ubiquitous computing tools that make computing a more integrated part of daily life are even more focused on communication.

As soon as we start using computing technologies for communication and collaboration, we start forming groups. Whether these groups are "real" groups that have some physical existence outside the computing environment, such as schools (Wyeth, 2006), homes (Crabtree and Rodden, 2004; Taylor and Swan, 2005), and workplaces (Newman and Landay, 2000; Su and Mark, 2008), or are groups that would not exist without the technological intermediary, such as virtual worlds (Ducheneaut et al., 2007), they have their own norms and dynamics that are legitimate and important subjects of study.

But what does the HCI researcher hope to learn about these groups? Often, the goal is just understanding: How is a technology used? How do the features of the design influence how people use the system? HCI researchers can use ethnographic techniques of participating in the group to gain a detailed and nuanced understanding that other methods cannot provide.

Lucy Suchman's study of the users of an electronic help system on a photocopier is perhaps the most famous example of ethnography in HCI. Starting from a framework that describes all action as being a product of the context in which it is taken—a model known as *situated action*—Suchman observed users attempting to complete a photocopying task with the help of an expert system designed to help them identify problems and complete tasks correctly. Through analysis of videos and a framework designed to demonstrate the relevant features of the interactions between the humans and the expert system, Suchman developed a rich and detailed understanding of how differences between the human model of the copier and the expert system's model led to communication breakdowns and task failures (Suchman, 1987). This study remains influential both as a fascinating discussion of how problems in human-machine communication can arise and as an example of the utility of ethnography in HCI.

Often, the human, social, and organizational aspects of information systems development are the ones most critical to ensuring the success of a project (Harvey and Myers, 2002). Ethnography can help in providing an understanding of the context in which specific interfaces or systems are developed and implemented. While research methods such as experimental design focus on reducing research to a small number of hypotheses with findings that are easily generalizable to other projects, ethnography focuses on the opposite: understanding the context of individuals in groups, their processes and norms, at a specific point in time, without generalization as a goal (Harvey and Myers, 2002). In addition, ethnographic approaches can be especially good for designing technology out of a workplace context: "Designing for pleasure demands a different approach from designing for utility" (Gaver et al., 2004, p. 53).

In a study aimed at understanding the importance of communication to multitasking, researchers "shadowed" 19 workers at a large US corporation, noting all of the workers' activities at their desks and following them around wherever possible. The resulting 550 hours of data, including over 13,000 events, were analyzed and coded to understand how workers switch between tasks, interlocutors, and communication media. The finding that coordinating activities with multiple people was a stressful and difficult activity led the authors to suggest that communication systems might be designed to identify interruptions that might require significant coordination effort (Su and Mark, 2008). The detailed records of communication behavior collected in this study would have been difficult, if not impossible, to collect via other means: observing the workers' activities at their desks, analyzing e mail transcripts, or otherwise observing some subset of their activities would have given an incomplete picture of the activities and interactions between modes of communication.

The example of the hospital information system (see Section 9.1) illustrates the other primary goal of ethnography in HCI—to understand system requirements and user needs. Successful design of complex or novel interfaces for use in unfamiliar domains, requires researchers to build a detailed, multifaceted understanding of how the work is done, how users interact, how tools are used, what users need, what policies are in place, and other related questions. It comes down to understanding the context surrounding where the information system will be used and who will be using it.

As in the case of the hospital information system, interviews, surveys, and other simpler data collection techniques may not be up to the task. Ethnographic research puts developers into the thick of the situation, letting them observe and study the situation firsthand. Extending the hospital example, most computer developers would not know how hospitals typically refer to patients. In a typical database design, data about individual humans is often referred to by an ID number or their last and first name. However, in hospitals, patients are often referred to by bed number. In a typical database design, the ID does not represent anything physical or meaningful, but in a hospital situation there is a physical meaning (the bed number or location) behind the identifier. This is an important difference that might be uncovered using ethnographic techniques but otherwise would not be obvious to the average researcher or developer.

The use of ethnographic investigations for understanding the requirements for a computer system is closely related to a design philosophy known as *participatory*

design (Schuler and Namioka, 1993). Starting from concerns about the impact of computer systems that are simply foisted on users without consideration of their needs and preferences, participatory design efforts involve users in every stage of design, from early discussions aimed at understanding problems, concerns, and needs, to brain-storming regarding design possibilities, evaluation of paper or other low-quality prototypes, and continued refinement of working systems. Although participatory design shares ethnography's interest in direct participation and engagement with the group being studied, the goal is generally different. Ethnography focuses on understanding people, their groups, their processes, their beliefs. Ethnography really focuses on understanding the problem. Participatory design is often the process of using ethnographic approaches with the end goal of designing a computer system. Participatory design can be seen as using ethnographic methods to understand the problem, and then intensely involving those same participants in building potential solutions to the problem. In ethnography, understanding the problem, the context, the culture, or the group interactions, is sufficient as a research study.

Participatory design as a development method is often used for systems development in three types of situations where a deep understanding of the situation is required. The first situation is where the user tasks are not well understood, such as the many different and complex tasks that teachers carry out in an average day (Carroll et al., 2000). The second situation is where the users themselves are not well-understood, such as people with cognitive impairment and memory loss (Wu et al., 2007). The third situation is where even minor errors in task completion can lead to catastrophic consequences, such as at a nuclear power plant or an aircraft carrier. While participatory design is ideal for developing all types of systems, it is very time and cost-intensive, and so participatory design is often used when the computer development projects are high risk, have a high likelihood of failure, and a high payoff for success. Most design projects cannot afford the time or cost involved in intensive ethnographic approaches.

That said, the delineations between some of these forms of research are often blurred, at best. Some self-described HCI "ethnographies" may involve theoretical propositions that make them seem more like case studies. Studies that aren't driven by a theoretical basis may make some use of ethnographic tools to build an understanding of contextual issues, without going into the detail associated with a full-blown ethnography. Projects involving the design of tools for domain experts—such as the hospital scenario described above—may involve techniques from ethnography, such as the shadowing of experts, while other similar efforts may seem more like participatory design than ethnography. No matter; the interest here lies in identifying appropriate research techniques and understanding how they might be used.

9.4 CONDUCTING ETHNOGRAPHIC RESEARCH

Ethnographic research can be extremely challenging. Ethnographic studies are usually conducted "in the wild," in homes, workplaces, educational settings, or other places where the "action" of interest takes place. As these studies often involve

extended periods of interaction and observation, researchers may find themselves in unfamiliar environments for long periods of time. This time may be spent juggling between two complex and intertwined goals: understanding how to navigate the dynamics of these unfamiliar settings and conducting the observations that provide the data for subsequent analysis. This can be a challenge, to say the least.

Researchers are often advised to carefully consider how well suited they are for a given project before embarking on ethnographic projects (Agar, 1980; Angrosino, 2007). In some cases personal tastes and preferences may make participation in certain studies inadvisable: an otherwise highly capable HCI researcher who is uncomfortable with the sight of blood might not be a good choice for our hypothetical scenario of information systems in intensive-care units.

Other considerations involve differences in background. Researchers may be ethnically, culturally, or socio-economically different from members of the group being studied and these differences might prevent them from being complete participants. Subtler forms of bias are also a concern: as individuals with distinct perspectives, we pay more attention to some details than others, often in ways that we are unaware of. Ethnographers should strive to work past such biases to the greatest extent possible (Angrosino, 2007). Bias-awareness training, careful attention to methodology—including rigorous documentation of evidence—and the use of multiple researchers (Agar, 1980) are among the techniques that might be used to overcome the inevitable biases.

9.4.1 SELECTING A SITE OR GROUP OF INTEREST

Selecting a target of ethnographic research is in many ways similar to selecting cases for a case study (Section 7.7). You will want to find groups that are interesting, logistically workable, and committed to supporting the goals of the study.

Selection may not be an issue. HCI ethnographies conducted in the interest of understanding the requirements of a system for a specific customer may not have a great deal of latitude in the choice of site. If the intensive-care information system is to be used at a specific hospital, then that is where the research should be conducted.

In some cases, you may be interested in finding groups that are representative of similar instances, while in others you may wish to study extreme cases. These goals will influence your choice of site: if you want to understand how technologies are used in schools, you might look for sites that have average funding levels and representative student bodies to get a representative understanding. On the other hand, comparison of extremes—for example, well-funded suburban schools with poorly funded urban schools—might provide interesting contrasts.

There may be barriers to your involvement and participation in specific types of ethnographic site. For instance, health-care systems in many countries protect the data of patients receiving health-care services. You can't just walk in and start examining data and going along with teams of doctors or nurses. A similar problem occurs in schools. You can't just walk into a school and spend time in a classroom. If there is sensitive financial information, you can't just walk in and start taking part in discussions at an investment bank. Similarly, governmental and military installations often have sensitive data and discussions, so your presence may pose a challenge. For these

situations, you may need to go through multiple stages of approval, including not only traditional institutional review board approval for research (see Chapter 15), but also certification, security and background checks, fingerprinting, sexual harassment training, and similar hurdles. You may be required to sign confidentiality agreements or other legal agreements. None of these should stop you from selecting a potential research site, but they are important considerations to be aware of.

In some cases, the selection of sites may be based on convenience—organizations, places, and people that you know well increase familiarity and comfort, which may make the research less daunting. Familiarity is not without its own hazards, however, as you might find that foreknowledge limits your objectivity.

If you are faced with the good fortune of having several potentially viable candidate groups to choose from, you might want to do a bit of preliminary work to inform your choice. Your interactions with the individuals in a group may provide some indication as to whether that group is a good candidate for your research. You'll always need to work to build a relationship with the members of groups that you study, but you might be more inclined to work with a group that seems welcoming and encouraging, rather than a group that seems hostile or uninterested.

Some groups, or group members, may have very good reasons for being wary about participating in an ethnographic study. They may be legitimately concerned about your research agenda, as the questions you ask, the conclusions you draw, and the reports that you write might have a very real impact on them. Consider a study of the work habits of repair technicians. You might be interested in building an understanding of technicians' work habits, in the hopes of designing tools that will help them more effectively share information. If, however, a candidate group perceives this system as an attempt to "de-skill" their work, threatening their employment stability or autonomy, they may be reluctant to participate. You may have to work to build trust to convince group members that participation in your project will not be something that they will regret.

You should also consider the practical impact of your research on the group that you are studying. If you are going to be spending a great deal of time in someone's home, school, or workplace, you might be in the way. Questions that you might ask in order to help your understanding might distract from the goals of the people that you're working with. One rule of thumb might be to try to make sure that the benefits outweigh the costs for your participants: they should get something worthwhile out of the time that they commit to helping your research (Angrosino, 2007). If you're studying work practices in order to understand the requirements for a new system—as in our hospital example—the benefits to the participants might be clear: you'll be able to build a system that will support their work. If the benefits are less immediate, you might consider trying to find some way to compensate participants.

9.4.2 **PARTICIPATING: CHOOSING A ROLE**

Participation is a critical part of ethnography. Realizing that there are limits in what can be learned by observing from the outside, ethnographers strive to be involved in the situations that they are studying. Participation removes the need for

intermediaries. Instead of relying upon members of a group to describe situations of interest, a participant-researcher can experience it first hand, relying upon their own powers of observation to understand the situation. Direct experiences of phenomena of interest can provide a richness of data that is almost impossible to get from any other research approach.

Having decided to participate, you must decide exactly what this means. You might be tempted to try to join the group—to become a member in order to study the group. This form of participation evokes images of anthropologists living in traditional villages. By sleeping, eating, and working with residents of the village, and becoming—as much as possible—part of their community, a researcher learns "from the inside." These *complete participants* (Gold, 1958) may learn a great deal, but at great expense, often involving years of fieldwork. Even if you are able to make this effort, you may run the risk of losing the ability to be a detached observer, as your identity as a member of the group may overwhelm your training as a researcher. Known as "going native" (Gold, 1958), this reaction may impair your ability to continue your research.

Some ethnographers have pushed complete participation to its logical limits, concealing their identity as researchers in order to make their membership in the group appear more authentic. This strategy has the advantage of easing access to the group: if you don't present yourself as a researcher, you don't have to explain your work or deal with concerns of group members. This strategy can be particularly appropriate in public or near-public settings where you generally would not be asked to justify your presence or behavior (Lofland et al., 2006).

Private settings pose more of a challenge for such "covert" research, as concealing your identity may mean deceiving group members as to the reasons for your participation. Even when conducted in the interest of fidelity of research, it is often considered unethical for researchers to intentionally misrepresent the goals of their research. Deceptions about a researcher's identity are also considered unethical if they are conducted in order to get access to a group or context that they would not otherwise be able to join (Angrosino, 2007). Thus, creating an avatar for participation in a virtual world (Ducheneaut et al., 2007) does not raise an ethical concern because membership in these worlds is not constrained and interactions are not intended to be private. However, falsely claiming to be a resident of a neighborhood in order to join a residents-only discussion group might be considered inappropriate. These concerns notwithstanding, some researchers have used covert participation in situations where they believed that it was the only way that they could gain access to the group (Lofland et al., 2006).

Pragmatic considerations can also limit the practicality of complete participation. Let's return to the hospital information system that we described earlier. You might be able to spend a great deal of time watching intensive-care nurses and physicians up close, and you might learn a great deal about how medical care is given in the ICU, but you probably shouldn't be involved directly in patient care. Even if you are a trained and licensed medical professional, it is not at all clear if you could be working effectively both as an HCI researcher and as a caregiver at the same time.
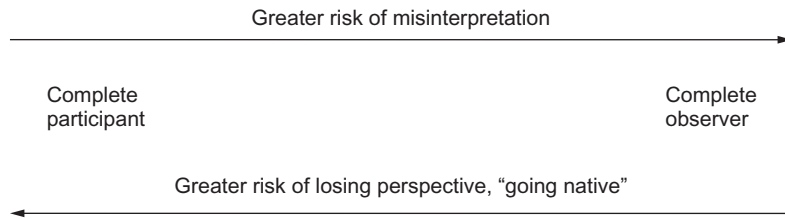
The opposite extreme—minimal participation—addresses some of these concerns while raising different issues. The *complete observer* (Gold, 1958) observes without interacting directly, limiting participation to simply "being there" as events of interest transpire. Complete observers remain detached from the subjects of their observation—they rarely worry about "going native." However, they do so at the cost of losing out on a wealth of information. If a complete observer sees something of interest that she does not understand, she does not ask a group member for clarification: she simply does her best to interpret what she sees. As a result, complete observers may at times misinterpret the particular details or significance of events (Gold, 1958).

Usability testing (Chapter 10) is a research method that uses primarily observation, and not participation, in understanding what challenges users are having with an interface. However, usability testing is generally a short-term data collection method, only focusing on a few individuals (generally not working together) and generally not focused on groups, human dynamics, or context (Siegel and Dray, 2005). Furthermore, usability testing generally has the goal of simply finding and fixing flaws in an interface, not understanding any higher-level research questions. Usability testing tends to come into the picture after an interface feature (or multiple potential interface features) has already been developed. Like participatory design, usability testing is focused on the end product of design, although participatory design is an entire design lifecycle approach, whereas usability testing is one late-stage activity. Ethnography is an approach to understanding the problem, whereas usability testing is often a method for evaluating potential solutions (Siegel and Dray, 2005).

Most ethnographic projects in HCI avoid the extremes of complete participation and observation, opting for an intermediate approach. Some ethnographers become temporary members of the group that they are studying, with all participants fully informed as to the nature of their participation. Possibilities include combining some degree of participation with observation. These researchers might generally disclose their role as researchers and then get more or less involved in group activities, sometimes participating, other times observing. One common approach is to "shadow" group members—following them around as they go about their business, asking questions as needed for clarification and interpretation.

These roles form a continuum of possible research approaches (see Figure 9.1). Researchers may adopt multiple, evolving roles throughout the course of a single project. One common approach is to begin research as a complete observer, using initial findings to create questions and goals for more in-depth participation (Gold, 1958).

Given both the difficulty of truly becoming a member of a group and the possibilities of misinterpretation associated with observation from outside the group, you might be tempted to observe a culture that you are already a member of. This approach has some appealing aspects. If you are part of a group, you already have access to group members, existing relationships, and trust. You also probably have some curiosity about how the group works and why it works this way (Lofland et al., 2006). Together, these factors give you a real head start. You may have to do a good

Greater risk of misinterpretation

Complete
participant

Complete
observer

Greater risk of losing perspective, "going native"

FIGURE 9.1

The spectrum of roles for ethnographic researchers.

Data from Gold, R., 1958. Roles in sociological field observations. Social Forces 36 (3), 217–223.

deal less preliminary work to build the groundwork for a study. You understand context and background that would be unclear to a newcomer, and group members might be less hesitant to respond to your questions. Even if you are open, and have disclosed that you are doing research, this may be seen with less skepticism.

If you find yourself intrigued by the ease of working with a group of which you are already a member, you would be well advised to reconsider this strategy as an automatic first choice. Your participation in a group may lead to bias and preinformed opinions—even worse than the complete participant who has "gone native," you *are* native. You may have deeply ingrained habits, opinions, and preferences of which you are not aware. Furthermore, you lack the fresh perspective associated with learning about a new topic and problem domain.

These concerns aside, group membership may, on occasions, lead to the identification of interesting opportunities for research: see the Ethnographic Research of Your Own Community sidebar for one example.

ETHNOGRAPHIC RESEARCH OF YOUR OWN COMMUNITY

In an ideal research world, you study groups or communities simply because they are interesting and in need of better understanding. In the reality of HCI research, you are often asked to study a specific group of people or work environment because:

- there are problems which need to be understood or improved upon, and you have relevant experience;
- there are problems or interesting research questions that you are aware of in a group of which you are already a member, and you could help to understand and address those problems.

Sometimes, you stumble across great ethnographic studies accidentally. In 1998, Jenny Preece, an HCI researcher, tore her anterior cruciate ligament (ACL) in her knee. She joined an online community called Bob's ACL Bulletin board to learn more about her injury, along with various treatments. She became a member of the group and later found the level of empathic support to be fascinating.

She decided to do ethnographically informed research to learn more about the people of the online community, what they communicated about, and how they communicated (Preece, 1998). She was not a strict observer, since she was already a member of the community. She could understand, more than a strict observer could, what it meant to have a torn ACL. The founder of the bulletin board, Bob Wilmot, was aware of her research and helped answer her questions.

In contrast, when her student Diane Maloney-Krichmar, continued to study the same community years later, she was a strict observer, not a participant in any form. As Maloney-Krichmar noted in her paper, to participate in the community fully would require faking the fact that she had the ACL knee injury, which she could not do, because doing so might also taint the findings of the research study, since she would be lying to community members and unable to take a full part in the discussions (Maloney-Krichmar and Preece, 2005).

Many of the previous examples focus on ethnography in physical locations, with face-to-face contact where researchers are physically present. Online research presents opportunities for ethnographic research that transcend these roles. The complete participant role in traditional ethnographic research is predicated on the notion that participation requires presence: to be a member of the group, you must be physically with the members of that group, interacting with them face-to-face. This proximity leads to many of the challenges of highly participative research, requiring researchers to be (at least passably) good actors and encouraging the connections that might cause some to "go native." More information about doing ethnographic research in online settings is in Section 9.5.5.

9.4.3 BUILDING RELATIONSHIPS

Ideally, every ethnographer would be warmly welcomed into the group that they are interested in studying. Members of the group would honestly and openly share secrets, discuss issues, and provide fair and unbiased assessments of how things work.

Unfortunately, this ideal may be realized only rarely. Even if there is nominal buy-in from someone associated from the group, that doesn't mean that all group members are interested or enthusiastic. Subjects of ethnographic research may be outwardly hostile or simply indifferent to the project. Workplace ethnographies may raise concerns among workers that the research may be used against them: "Maybe they're going to use this study to figure out how to eliminate my job."

Conducting ethnographic research would be very difficult indeed if you were working with people who didn't like, trust, or respect you. Careful attention to some fairly common-sense principles can help you define yourself as someone with whom folks in the group will want to work with. Trying to be helpful—being a participant instead of a burden—can help engender good will, if you follow through on your promises. If you're not acting as a complete participant, you should take time to explain to someone why you're there, what you hope to learn, and what you hope to do

with that knowledge. You should also respect the needs and goals of the individuals you are speaking with: your need for research data should not trump their need for privacy, job security, or other things (Angrosino, 2007). Making people feel threatened is probably not the right way to get good research data.

It is important to try to understand the conventions and norms that are shared by members of the groups that you study (Agar, 1980). Even if you're working with groups of people who are culturally and socio-economically similar to you, they may have very different habits, expectations, values, or jargon. Understanding these cultural factors may not be easy to do, but it's worth the effort. You don't want to say something that offends someone in the group and you don't want to be misinterpreted. Slang and jargon are particularly challenging in this regard. You may think that you know the meaning of a slang term in your particular context, but you'd be well advised to make sure that your understanding is correct (Agar, 1980).

9.4.4 MAKING CONTACT

Many ethnographic efforts start with discussions with a small number of individuals. Even if you are introduced to all members of the group from the outset, you can't start talking to them all at once—it's simply not possible. In some cases, particularly if the group of interest is not completely defined, your initial contacts may help you meet others.

Your initial contacts play a very important role. Well-chosen contacts can help you orient yourself to the ways and workings of the environment that you will be studying. Particularly if they are well respected, they can help smooth the way, convincing others who trust them that you are "OK."

Because your first contacts will influence your perceptions of and interactions with other group members, you should carefully consider who you choose to work closely with at first. Experienced researchers have noted that the first people to talk to ethnographers often fall into one of two categories: *stranger-handlers* and *deviants* (Agar, 1980).

Stranger-handlers are people who make it their business to work with people who are new to the group. They introduce you to others, show you around, and appear to be very helpful. They might also show you a particularly slanted view, emphasizing details that they want you to know about while omitting others that they want to leave hidden. If there are factions within the group, a stranger-handler might encourage you to associate with his faction, possibly alienating members of other subgroups. As outcasts who may not be well respected, a deviant might try to use you to gain attention, to validate their otherwise under-appreciated role in the group, or to denigrate their enemies. As your goal is to gain a broad understanding of the group, you should beware of such people.

Unfortunately, you may not know that you're dealing with a deviant or a stranger-handler until it is too late. You may want to rely upon your initial feel for each individual—do they seem trustworthy? Do you "click" with them? If so, they may be good bets. If, however, they seem to be providing you with selective

information, bad-mouthing others, or trying to manipulate your efforts, you might want to watch out.

The people who you choose to work closely with should also be those who can provide good information. Someone who knows few people, doesn't get along with others, doesn't explain things well, or is unobservant is unlikely to be a good informant (Agar, 1980) and you probably want to avoid such people.

Even if you find an initial informant—or set of informants—who is trustworthy, seemingly unbiased, and well respected by a broad spectrum of the group, you might be well advised to avoid becoming too closely associated with any group members. You don't want the appearance of close ties with anyone to impair your ability to work with other group members (Agar, 1980; Angrosino, 2007). This may be easier said than done.

Whoever you choose to work with, you should remember that these informants are not necessarily telling you the truth. This is not to say that they're lying—they're simply giving you their viewpoint. The notion of truth in describing human interactions is more than a bit troublesome. Your job is to use your initial informants to help you derive questions, build theories, and plan further investigation. As we see below, you will use subsequent interactions with other group members to help provide a broader perspective.

Participating in a group can be difficult—you may find that you don't like the people that you are working with, that you don't have access to the information that you need, or that you are inappropriately identifying with the subjects of your research. You may also find that you have to work to maintain relationships. A variety of strategies, including presenting yourself as nonthreatening and acting as if you are somewhat incompetent and need to be taught about the group that you are studying (Lofland et al., 2006), can help you convince participants that you are someone to be trusted.

9.4.5 INTERVIEWING, OBSERVING, ANALYZING, REPEATING, AND THEORIZING

Ethnographic researchers have developed a variety of theoretical frameworks to inform their investigations (Angrosino, 2007). Many of these frameworks provide perspectives on how groups function and how meaning is constructed out of human relationships. As you go about your ethnographic research, you should always remember that your job is to create an interpretation of the potentially biased, incomplete, and somewhat contradictory data points that you collect from talking with and observing members of the group. The result may not be "the truth" about this group, but ideally it provides some understanding and explanation of how the group functions.

Like case studies (Chapter 7), ethnographic studies rely upon multiple data collection techniques to gain a broad perspective, with the hope of *triangulating*—using corroborating evidence from multiple perspectives to increase confidence in the validity of conclusions that are drawn. As with case-study research, ethnographic

studies rely on interviews, case studies, and documents or other artifacts as their primary sources of data.

Interviews in ethnography serve many purposes. Unlike traditional interviews (see Chapter 8), in which a researcher has a single meeting with a study participant for a limited period of time, an ethnographic interview is often part of a longer, ongoing relationship. In the early stages of a study, interviews may be informal discussions aimed at building trust and understanding broad parameters. As you may not know what you're looking for at first, your early interviews are likely to be very open-ended and unstructured (Angrosino, 2007). In fact, these informal interviews may not even feel like interviews. You might be asking questions as people show you around, discussing issues of concern as you interact with group members, and otherwise participating in seemingly ordinary interactions. Although these conversations might not feel like interviews, they can be useful data collection techniques. A commonly used technique in ethnographic interviews involves presenting participants with items—known as "probes"—designed to provoke reaction and spark conversation (See Chapter 8 for a discussion of probes).

The goal of these informal interviews is generally to get people talking. As they say more about the environment that you're studying, your informants increase the breadth and depth of your understanding. Appropriately asked questions can be very useful in this regard. If they describe an interesting situation, you might ask how often it occurs. Leading questions present a viewpoint that invites either agreement or dissent: "Is this tool really that hard to use?" Other questions might invite comparisons, contrasts, or detailed explanation (Agar, 1980). The challenge of planning questions like these in the course of ongoing conversation may seem substantial, but you might find that your curiosity as a researcher takes you a long way. If a comment piques your interest, find a respectful way to ask for more detail.

Not all of your interviews will be completely informal. More structured techniques, such as life histories (Agar, 1980) (see the Design for Alzheimer's Disease sidebar in Chapter 7) and time diaries (Chapter 6), can be informative components of ethnographic studies. As your data collection and analysis leads you to build a deeper understanding of the group that you're studying, you may find it useful to conduct slightly more formal interviews with group members with whom you've not previously interacted. These discussions can help you validate models or conclusions derived from earlier interactions with other informants.

Observation is easier than it sounds. Just stand back and watch, right? If only it were that simple. Unfortunately, several factors work against us. As much as we might like to think that we're objective observers, we're not. By necessity, we filter what we see and hear, and interpret our observations through the lenses of our own history, experience, expertise, and bias. The goal of ethnographic observation is to shed this baggage, in the hopes of seeing things with "new" eyes, perhaps as a stranger would (Angrosino, 2007). Of course, this is easier said than done, particularly if you are in a situation that is somewhat familiar. A clear distinction between observation and interpretation might be helpful in this regard (Angrosino, 2007). If you only record what you see ("the user opened the help facility and searched for

several different terms"), you run less risk of misinterpreting or injecting bias than you do if you interpret what you see as it happens ("the user became frustrated when she was not able to find help with the feature"). You might try to regularly challenge yourself to broaden the scope of your observation: ask yourself, "is there anything I'm missing? Is there anything that I think doesn't look interesting?" If you force yourself to examine all aspects of a complex situation, you may get a broader, less biased picture of what is going on. That said, it is worth noting that observation is a skill that might require significant practice to develop.

Taking appropriate notes from ethnographic observations—and, to a lesser extent, informal interviews—is a daunting challenge. You might be advised to record relevant details such as time, place, identities of people present (perhaps anonymized to protect their privacy), and descriptions of the context, behaviors, and interactions, and include word-for-word transcriptions of conversations (Angrosino, 2007). Although such information would undoubtedly convey a detailed picture of the situation that you have observed, there are significant practical problems involved with overly detailed notes. You will soon become overwhelmed, as the quantity of data will quickly become enormous. Furthermore, it's virtually impossible to record that much data and to observe at the same time: as you take notes, you simply miss out on what is happening (Agar, 1980). Audio or video recordings can help, but analysis of these records can be a tedious, time-consuming chore in itself.

Deciding what is interesting enough to include in your notes, and understanding how to describe it, may become somewhat easier once you have passed the initial stages of your work. When you first start out, you may not have much idea of what is interesting: you're in an unfamiliar context and everything is fair game. As you begin to build some understanding, you may work your way towards an understanding of what is interesting and what is not. Once you have this baseline, you might think of your field notes as recording observations that describe familiar events in terms of patterns that you've identified, while noting unfamiliar events that may be worthy of consideration. You might also make note of questions that arise: if you see something that you don't understand, it may be an appropriate subject for future investigation (Agar, 1980).

Timing is also a challenge in recording notes from observations and informal interviews. You might try to be prepared to record observations at all times, but you never really know when something interesting is going to happen. You might hear an interesting discussion or witness a relevant interaction just when you least expected it. In this case, the best that you can do might be to remember as much as possible and write notes as soon as possible. This is, of course, a highly fallible process, as you are likely to forget important details and misremember others (Agar, 1980). You would be well advised to seek out additional validating evidence for any observations that are recorded long after the fact.

Documents, archives, and artifacts can also be useful sources of information. Records that describe past activities: pictures, letters, e mails, deliverable documents, and even tools; can provide information about how a group works and what the dynamics are like. An ethnographic study of a software engineering group might

investigate process documents, e-mail exchanges over the course of one or more projects, papers, and presentations generated during the course of the work in order to understand how that group works. These archival data sources have the advantage of being relatively static and impersonal—you can take your time reading old e-mails and you don't risk asking an inappropriate question. At the same time, these materials may be incomplete, biased, or error-prone (Angrosino, 2007).

Having collected data from interviews, observations, and archives, your next step is to analyze it. Data analysis generally combines qualitative and quantitative analysis techniques. This chapter focuses on collecting data using ethnographic methods, but Chapter 11 helps you take your various observations and group them into categories and frameworks that help you understand and explain the situation. Quantitative techniques help you ask questions about the frequency or prevalence of certain behaviors. These analyses are very useful for moving your understanding from the general ("this happened frequently") to the specific ("this happened in 79% of cases").

Analysis in ethnographic research is often a precursor to further data collection. As you examine your data points to identify patterns, you may find other questions arising. In some cases, you may be uncertain about the interpretation of an event or a comment—you may wish to ask someone for clarification or simply for confirmation that your interpretation is correct. Other data points may open up entirely new lines of questioning. Observations from a community event, such as a meeting or public gathering, may lead to multiple questions that you might ask at a subsequent interview—whether formal or informal—with someone who was present (Agar, 1980). This iterative process can continue for multiple rounds (Figure 9.2), until you run out of resources (time and money) or have learned all that you're going to learn.
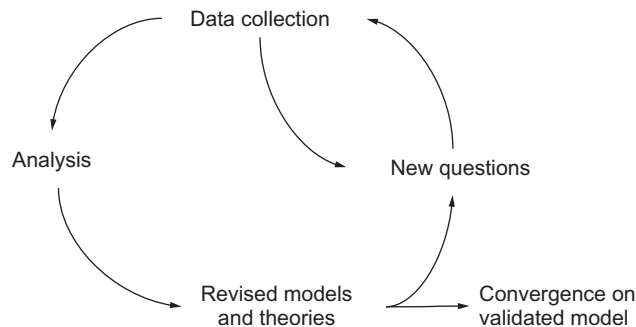

FIGURE 9.2

The iterative process of ethnographic research.

Although many ethnographers strive to develop models and theories that place their observations in some sort of theoretical model or framework, this approach is not universally shared. Some researchers reject theories and models, claiming that ethnographers should simply describe what they see, without building models that may reflect researcher or procedural biases as much as (if not more than) they reflect

the phenomena being studied. Others reject this viewpoint, arguing that researcher participation in deciding what should be observed and how it should be analyzed inevitably leads to bias (Shapiro, 1994; Sharrock and Randall, 2004). Of course, if the goal of your ethnographic research is to understand requirements for a system that will be built, you will probably find yourself building a model of some sort.

If you decide to use your ethnographic research to develop models, you should strive to develop robust explanations and descriptions that are based on all of your data. As you analyze the data, you should try to make sure that you are not "cherry-picking" the data. If there are observations that are not consistent with your model, then you should consider revising your model or looking for other potential models. If you seek out, but do not find, data points that disagree with your model, you can be more confident of the correctness of the model.

Because all ethnography is inherently interpretive and qualitative, there are often legitimate questions as to why one model is better than the other. Comparison with alternative models can also help in understanding the strengths and weaknesses of your model, because you could potentially argue that your model fits the data better than other alternative interpretations.

Other measures that you might take to improve the validity of your findings include the use of multiple informants and multiple observers. Multiple informants help you avoid the distortions that might occur from talking to only one member of the group. Interacting with members who differ in background, perspective, experience, or demographic factors such as age, gender, and ethnicity, can help you understand the diversity of perspectives. Having another colleague (or two or three) study the group can minimize the impact of biases of any individual researcher. If your colleagues come to the same conclusions as you, despite having interviewed different people or observed different events, you can have increased confidence in those results. Just as with informants, diversity of observers can be a useful strategy. (Angrosino, 2007).

9.4.6 **REPORTING RESULTS**

Ethnographic reports are similar to case study reports (Chapter 7). You want to describe your goals and methods, along with a justification of the specific groups—how were they chosen and why? You should describe your methods of data collection and analysis, along with presentation of raw data and analytical results. Matrices, charts, and figures can be very helpful, particularly for analyses involving quantitative data. Another important similarity with case study reports involves discussion of rival explanations: if you've considered and rejected alternative models because your preferred models were better suited, say so, and explain.

Like case studies, ethnographic reports tell a story. You should consider interesting incidents and include direct quotes where appropriate.

Ethnography also often involves consultation with participants. When appropriate, you might consider sharing your report with group members before it is published. This gives them a chance to understand what you've done and why, thus increasing the chances that they have positive feelings about the experience. Your informants can also provide important reality checks—if they think you've misinterpreted

important (or perhaps not-so-important) details, they'll let you know. This sharing of draft reports may not be appropriate in some circumstances, including (but not limited to) studies that involved complete participation (participants who weren't aware of the research might be somewhat upset at seeing the report) and situations in which participants might be interested in "slanting" the contents of the report to meet their (real or perceived) interests.

Finally, like case studies, ethnographic research reports often raise questions of privacy and confidentiality. When possible, consider anonymizing location details. The hospital study discussed at the beginning of the chapter might be described as occurring in a "large urban hospital," instead of providing the hospital name. Uniquely identifying details might be suppressed or used only with permission of the groups and individuals involved.

9.5 SOME EXAMPLES

Ethnographic methods have a rich history in the social sciences. However, they have only recently come to the forefront in the area of HCI. A number of studies have utilized ethnography methods to understand the context of technology usage. Most often, these ethnographic studies take place in homes, workplaces, educational settings, and virtual settings. While ethnographic research is not limited to those four types of setting, they are the ones that seem to garner the most attention and examination in the HCI world. Studies of mobile devices have also started to come to the forefront.

9.5.1 HOME SETTINGS

One important area of technology usage is people's homes. To separate out and examine the technology in a sterile lab would be to miss the rich context of home usage. One specific series of ethnographic studies of homes and technology use in different countries provides a baseline for understanding the challenges (Bell et al., 2005). The bottom line is that country, culture, and religion have a great impact on how technology is used in homes. While not specifically an article on ethnography, Chavan et al. (2009) report on examples of home technology products that failed because designers didn't understand the context of usage. For instance, in southern India, clothes washing machine sales were awful for Whirlpool, because traditional southern Indian clothes, using very thin fabrics, were often getting caught and shredded in the washing machines.

There are also, in many cases, gender issues to understand. In many countries, even though women put in an equal amount of work in the workplace, women also perform a majority of domestic household tasks (Blythe and Monk, 2002; Rode et al., 2004; Bell et al., 2005). In one ethnographic study, it was noted that while men may not do an equal share of the household work, they often feel guilty about this (Blythe and Monk, 2002). This ethnography study noted that many domestic technologies

are esthetically designed with a gender inclination to them (often, towards women) and posed the question as to whether household technologies should be designed with more of a male focus (Blythe and Monk, 2002).

In another ethnographic study of domestic (home) use of technology, a "felt board" was used to help model daily home life (Rode et al., 2004). The board had different sections for different rooms in the house. Users were asked to place felt icons representing appliances in appropriate rooms, and to identify if they programmed these devices in advance (although the term programming wasn't used). The fuzzy felt board was used to help understand patterns of usage, after participants provided a tour of where the devices were in the home (Rode et al., 2004).

Another ethnographic study examined the use of cleaning products by older individuals (Wyche, 2005). The goal was to better understand the challenges that older individuals face in trying to use cleaning products in their homes, to inspire some potentially useful designs for new cleaning technologies. The researcher observed 20 individuals, between the ages of 69 and 91, in their homes to learn what types of cleaning product and technology they use, where they store them, and which ones are very hard to use. The researcher then presented ideas for some potential technology solutions to these challenges (Wyche, 2005).

9.5.2 WORK SETTINGS

Ethnographic methods are often used to examine the context of technology usage in the workplace. For instance, ethnographic methods were used to understand how insurance claims adjusters do their job in the workplace. Researchers observed the entire process of claims handling, with a special focus on fraudulent claims (Ormerod et al., 2003). A number of process barriers were discovered, such as poor documentation and communication, and claims adjusters were discovered to use a number of heuristics and alternative explanations to discover fraud. This ethnographic research of how claims adjusters work was then used to help develop a new software tool for detecting insurance fraud.

Ethnographic methods were also used in studying a highways department from a state government. The goal was to understand the process of designing and building a bridge, so that an electronic-document management system could be built (Suchman, 2000a,b). One of the challenges was in understanding how electronic documents and paper documents were used. It was discovered that it was important to design connections between the electronic and paper documents, and then determine who needed access to the electronic documents, since paper documents have limited access based on physical location but electronic documents don't have that limitation.

Health-care settings are also of interest to ethnographers. Pedersen and Wolff (2008) documented ethnographic research in two physical therapy clinics in the USA, to understand how small health operations work. They had originally wanted to observe at general health-care clinics (and they had done previous interviews with 10 small health-care clinics), but had problems getting access to observe at these sites. Therefore, physical therapy, in which a lot of patient treatment occurs in a

semi-public gym space, seemed like a good compromise (Pedersen and Wolff, 2008). Ethnographic observations helped in understanding work practices and challenges the physical therapy clinics might face as they moved towards full electronic medical records. Similarly, Balka et al. (2008) documented ethnographic studies in Canada and Austria, where again, the goal was to better understand medical work practices, to assist in the development of a new health information system. The study looked at various departments within a hospital, such as emergency departments, oncology, and neurosurgery (Balka et al., 2008).

While office settings are obviously the most common setting, ethnographic methods are even more useful in nonoffice-based work settings. For instance, one ethnographic study examined the potential use of technology in a vineyard setting. Specifically, the researchers wanted to understand the potential use of sensors across a vineyard (Brooke and Burrell, 2003). The researchers became participant-observers, working in vineyards, helping with harvesting, and assisting with grape crushing. The researchers were better able to understand how sensors could be used, to monitor microclimates (combination of sunlight, rain, temperature), which could then predict the chances of grape disease. This, in turn, could provide useful information on which areas of the vineyard needed more attention, labor, chemicals, and different harvesting times.

9.5.3 EDUCATIONAL SETTINGS

Ethnographic methods can be especially useful for understanding the complex context of school settings. For instance, ethnographic methods were used in understanding how children (typically between 4 and 6years old) spend play times in a kindergarten (Wyeth, 2006). In the daily schedule of a kindergartener, there is both structured group time and "loosely structured, self-structured, free time activities." The free-play activities themselves could be divided into three categories: calm activities, play, and artistic interactions. This increased understanding of how young children play in classroom settings may hint at some potential possibilities for technology in early childhood settings. For instance, technology for young children may need to be more flexible, allowing for creativity and discovery, and not be separate from but, rather, work in tandem with the other activities going on in the classroom.

The importance of understanding the context increases when doing a cross-cultural study of educational settings. For instance, Druin et al. used a number of methods, including ethnographic observation in the classroom, to understand how children in different cultures used the International Children's Digital Library, how their reading patterns changed over time, and how their reading patterns influenced communication with others, interest in other cultures, and attitudes towards technology and libraries (Druin et al., 2007).

Ethnographic methods for use in education are not limited to young children. Becvar and Hollan (2007) used ethnographic methods to better understand how dental hygiene students learn. The dental hygiene students were in postsecondary

education and, after completing their academic program, had to pass both state and national certification exams. The researchers observed the tools and technologies used by students, the activities and circumstances that occurred, and how the students studied and practiced, both at the university and at their homes (Becvar and Hollan, 2007). The goal of this ethnographic research was to understand how dental hygiene students learn, with the eventual goal of designing instructional technology to assist students in their instructional program.

9.5.4 ETHNOGRAPHIES OF MOBILE AND UBIQUITOUS SYSTEMS

In taking computing beyond the desktop, mobile and ubiquitous systems create context-sensitive environments where computing is part of some other, larger opportunity, instead of a primary focus of its own. Understanding how people make use of these systems while traveling, meeting with friends, or going about their daily lives presents intriguing challenges for ethnographers.

A study of the use of in-car global positioning systems (GPS) used ethnographic techniques to understand how the tools changed perceptions of the larger environment and of the tasks of driving and navigating. To address these questions, a team of researchers went along for several rides—some planned and some conducted specifically for research purposes—with GPS users and, in some cases, additional passengers. Data from these rides—which lasted between 1 and 3 hours—included hundreds of pages of notes and transcriptions. Analysis of this data indicated that the GPS systems led users to be both less engaged (they didn't have to worry so much about seeing turns and landmarks) and more engaged (they were able to learn about parks and other attractions that were nearby but not visible from the road) with the surrounding environment (Leshed et al., 2008).

Ethnographic studies can be useful for understanding how technology use changes over time. A study of iPhone users used ethnographic techniques to understand how perceptions of the device changed over the course of several weeks. Six participants were recruited on the basis of their expressed interest in purchasing an iPhone. One week before purchasing the phone, each participant wrote a narrative describing their expectations and completed a survey indicating the importance of each expectation. After purchasing their phones, participants listed activities related to the phone, estimated the time spent, picked important experiences, and rated the product relative to each specific situation. Findings were used to build a model that described the use of the iPhone as a sequence from anticipation of using it, to orientation to features, incorporation of the device into everyday life, and then to identification with the phone as an important part of their lives (Karapano et al., 2009).

Ethnographic investigations of ubiquitous computing have required some HCI researchers to go into some unexpected places. One project examined the navigation needs of firefighters, in the hopes of identifying opportunities for developing ubiquitous systems that would help firefighters find their way out of hazardous, smoke-filled environments. The research team developed a series of simulations—conducting

research in actual fires being, of course, too dangerous—aimed at exploring how a tool might work. Members of the research team then donned firefighting gear and joined in a simulation involving navigational activities commonly used by firefighters. Observations from their participation, and from observing firefighters in other simulations, helped the researchers understand how firefighters use improvisation and collaboration to navigate while fighting fires (Denef et al., 2008).

9.5.5 VIRTUAL ETHNOGRAPHY

Most of the examples discussed thus far in this chapter involve "real-world" ethnographies—studies of groups and communities situated in familiar, physical settings. This is not an inherent limitation in the technique—ethnography does not always mean a researcher being present physically to observe the group or community. The growth of countless online communities supporting many different types of interaction presents the possibility of "virtual ethnography."

The term "virtual ethnography" has been used to describe different things, such as using web cams or videos (Blomberg et al., 2007). However, this in no way involves participation and, furthermore, there is a high likelihood of missing a lot of contextual information as people may act differently for the camera, shut off the camera at times, or avoid the area with the camera. If the researcher is not in the context, this leads to a poorer quality of data collection and understanding. However, when ethnographic methods are used to research a community that is strictly virtual or online, there is less likelihood of missing anything, as the "there" is only online. If participation is the goal, if being in the context is the goal, researchers can "be" in a virtual community and experience it as everyone else is experiencing it.

The virtual nature of these communities presents some opportunities and challenges for ethnographic researchers. Online identity is much more fluid and controllable than it is in the real world. In many online groups, message boards, and virtual worlds, users can control exactly what others know about us and how they see us. This can be very convenient for ethnographic study, as researchers can easily define themselves as complete participants (with some limitations), without having to face the challenge of playing those roles in frequent face-to-face relationships. Furthermore, researchers might find that maintaining scientific objectivity is relatively easy when all interaction with the subjects of study are conducted through the mediation of a computer screen.

The tenuous nature of links between online identities presents some interesting possibilities for ethnographers. As many online communities require little, if any, direct link between a virtual identity and a real person, conducting an ethnographic study without revealing one's identity as a researcher is a very real possibility. Furthermore, the transient and artificial notion of participation in these virtual worlds makes complete participation a very real possibility. Before embarking on any study of this sort, you might want to consider what circumstances merit revealing your identity as a researcher. For example, you might decide to "out" yourself to an

individual or a larger group if you feel that other participants are becoming suspicious of your motives.

The construction of multiple identities presents further intriguing opportunities. As many virtual communities allow users to create multiple online identities, virtual ethnographers might use multiple online manifestations to examine community responses to different types of behavior or even to create situations that might be the focus of studies. For example, a researcher conducting a virtual ethnography might start an argument between two online identities that she controls as a means of studying how other participants would react.

Of course, this multiplicity of identities cuts both ways as well. Virtual ethnographers may face greater challenges in evaluating the honesty of the people with whom they are interacting. Barring external confirmation—such as verifiable real-world interactions—it may be hard to confirm the claimed identities of online interlocutors.

As virtual environments run the gamut from simple text-based forums to social networks and online worlds, the types of ethnography that may be conducted will also change. Fully graphical environments, such as Second Life, present opportunities for observing group interaction, physical positioning, and other visual cues that are not generally available in text-only environments. Although these cues may make ethnographies of graphical virtual worlds seem more "real" than other virtual ethnographies, it is important to note that the questions of identity don't ever disappear.

In Section 9.4.2, the Ethnographic Research of Your Own Community sidebar presented information about the ethnographic research done into online empathic support communities. The example given was of an online support community for people with a torn ACL (Maloney-Krichmar and Preece, 2005). Ethnographic methods have also been used to examine multiplayer virtual worlds. For instance, Ducheneaut and Moore used ethnographic methods to research the Star Wars Galaxies multiperson online role-playing game. The two researchers each created a character (one a combat-oriented character, the other an entertainer) and logged in for a minimum of 4 hours per week for 3 months. They later created two additional characters and tried to encourage other role-playing individuals in the Star Wars Galaxies to communicate with their characters (Ducheneaut and Moore, 2004). Specifically, they spent time in locations collecting data on the frequency and type of visitors, types of interaction, and related factors that could be used to characterize the social activity in these places (Ducheneaut et al., 2007). As complete participants, they were able to participate in genuine interactions, without having to reveal themselves as researchers or to maintain the pretense of being "real" group members.

Of course, many online communities have face-to-face components and this is where the dividing line between virtual and physical can become very complex. The Researching Online Dating sidebar discusses the situation of research into online dating communities. In these communities, the interaction starts out virtual but has the stated goal of moving towards face-to-face meetings.

RESEARCHING ONLINE DATING

One of the more fascinating topics being addressed by HCI researchers in recent times is the topic of online dating. Individuals go online to various sites (such as http://www.eharmony.com), providing photos and descriptions of their interests in the hopes that they might meet people for dates or relationships. With millions of subscribers of various ages, these sites represent an interesting area for HCI research. Although a number of approaches have been used to study online dating sites, ethnography has not been the primary approach. This raises an interesting question—can ethnography be applied to online dating?

At first this might seem like a research focus on individuals but online dating communities are groups with group norms, accepted practices, and shared group communication tools (such as chat rooms). These online groups differ primarily from work groups in terms of the goal of the interaction (dating, not work), the goal of the presentation (to look attractive and interesting, rather than to present information), and the transient population of members in the group (people join and leave the online dating community very rapidly). An example of a group norm and practice is that if you e-mail someone and they do not respond, it is considered totally inappropriate to e-mail them a second time.

Hancock et al. (2007) took the approach of recruiting people who were already involved in online dating, to determine the accuracy of their online dating profiles. A self-selected group responded to their recruitment advertisement. The researcher team met with these 80 participants, who presented copies of their online dating profiles (Hancock et al., 2007). Participants were asked to rate the accuracy of their profiles with regard to height, weight, and age. Only 18% of participants had inaccurate age information in their profile but 48% of participants had inaccurate height information and 59% of participants had inaccurate weight information in their online profile. An analysis of the participants' perception of profile accuracy showed that most participants were aware when their profile information was not accurate and were aware that this could be potentially deceptive.

Fiore and Donath (2005) examined how people in online dating communities tend to communicate with other people who have similar interests and preferences. The researchers were able to broker an agreement with a dating site to access profiles, statistics, and e-mails (Fiore and Donath, 2005). It is unclear in the paper if users were aware that their profile information was shared with researchers, although it is unlikely (since the researchers did analysis on over 236,000 messages sent from over 29,000 users to over 51,000 users). An analysis of 110,000 conversations (messages between a unique pair of users), found that 78% were single messages that were not responded to by the recipient. Users were more likely to contact other users who had similar characteristics (such as "wants children," smoking, educational level,

and religion) and responses to those initial contacts were even more highly correlated to the presence of similar characteristics. Note that "user" is a more appropriate term than "participant," since these users did not choose to participate in the research.

Lee and Bruckman (2007) examined the use of general purpose social networking sites (such as MySpace and Facebook) for dating. They interviewed 12 people who had used Friendster or MySpace for dating (Lee and Bruckman, 2007), recruited through public postings (e.g. on Craigslist) and word of mouth. Although some of the interviews were in person and some were conducted by phone, all of the participants allowed the researchers to examine their social networking profiles. Participants described the credibility provided by contacts within the social networks as an advantage in meeting potential dates, as friends would be likely to challenge or respond negatively to misrepresentation. Participants specifically found the set of "top friends" useful for providing credible information. The number of friends, types of comment left by friends, and types of picture posted also provided useful details about potential dates. Participants who began dating people met on a social networking site also commented that the site could provide useful feedback on their relationship status, through their rank on their new partner's "top friends" list.

Fiore et al. (2008) tried to identify online dating features most strongly associated with assessments of the attractiveness of potential dates. They used a random selection of 25 male and 25 female profiles from the Yahoo! Personals website, five each from different cities in the USA (Fiore et al., 2008), constructing four different versions of each profile: picture, free text, fixed-choice answers, and full profile, which includes all three sections. A group primarily made up of university students evaluated the various profile components for attractiveness. The researchers found that the photo had the greatest impact on perceptions of attractiveness, but the free text also greatly influenced perceptions of attractiveness. The fixed-question responses did not impact on perceptions of attractiveness, except in cases where they were used to evaluate "deal-breakers," such as smoking.

Although the complex phenomena and group dynamics of online dating might make ethnography seem an appealing research method, there are a number of troubling ethical and logistical questions. If you were to research online dating communities, would you be a true participant? Would the emotion of meeting and dating these people cause you to lose your sense of objectivity? Furthermore, is it ethical to go on a date acting as if a long-term relationship was the main goal, when it is a research exercise? Would that be misleading? If you were to notify people that you are doing research, would that lead to loss of credibility or access into the community? If you were to not notify people about your research, wouldn't that be unethical? Would it even be possible to be a complete observer, watching from the sidelines?

(Continued)

RESEARCHING ONLINE DATING—CONT'D

How would that work? Note that in two of the research studies above, profiles or data were taken from online dating sites and used in research studies, without the express permission of the owners (although the terms and conditions of site usage would allow it). Although these people were not research subjects, their online profiles were involved. Clearly, if ethnographic methods were used and researchers went out on dates with unsuspecting research participants, this would be a far more serious ethical concern. This leads to an important question: how can you do ethnographic research and collect accurate data, while participants are aware of your research? For further discussion of the ethical issues associated with online dating research projects, see Section 1.5.2.4.1.

If a community has both a physical and a virtual component, both might be good candidates for ethnographic research. For instance, Ploderer, Howard, and Thomas (Ploderer et al., 2008) were interested in researching the community of bodybuilders, people who are passionate about staying fit, building muscle, and taking part in bodybuilding competitions. The researchers used ethnographic methods in both the physical community and the online community. They went to seven bodybuilding gyms to observe and also attended two bodybuilding competitions. In addition, the BodySpace social networking website has over 160,000 people interested in bodybuilding. The researchers created a profile and for 4 months, participated with and observed the members of the community and communicated with various community members (Ploderer et al., 2008).

9.6 SUMMARY

Ethnographic methods are very useful in understanding the context of technology usage. By examining the human, social, and organizational contexts of technology, a deeper understanding of who these users are can be developed. In ethnographic traditions, a better understanding of a group of people and their traditions and processes is itself a noble and worthwhile goal. However, in the HCI community, ethnography is often used as a first step, to understand a group of users, their problems, challenges, norms, and processes, with the eventual goal of building some type of technology for them or with them. Currently, ethnographic research methods are used most often in home settings, work settings, educational settings, and online. However, new approaches to ethnographic research are being developed to study, for example, how people use ubiquitous computing in real-world settings anywhere, such as the street, the subway, or a park, for activities including role-playing games, geocaching, and education (Crabtree et al., 2006).

DISCUSSION QUESTIONS

1. Ethnographic research has been described as inductive. What does that mean?

2. Is generalization a goal of ethnographic research?

3. How is participatory design similar to ethnographic research? How is it different?

4. What are three potential challenges in finding a group to study?

5. What are the four most common settings for doing ethnographic research in human-computer interaction?

6. Participating in a group implies changing it. In the most obvious sense, the group has one more member after the ethnographer joins it. More subtly, the addition of a new member might alter the dynamics of communication and interaction between group members. How does the role that the ethnographer plays influence the extent of the changes that his presence might bring? Can you suggest any approaches that ethnographers might use to minimize the impact of their presence upon groups being studied?

7. Some people might think that the ultimate form of participant research would be to conduct an ethnographic study of a group of which one was already a member. For researchers, this might mean studying research groups, academic departments, corporate teams, or professional societies. What concerns would you have about the appropriateness and validity of such research?

8. Go back and reread the Researching Online Dating sidebar. How could ethnographic methods be used in researching online dating communities? How could you study the community in a way that is both ethical and did not greatly influence how people would act towards you?

9. Workplace ethnographies present specific challenges in navigating the often complicated interactions between employees at differing levels of authority and responsibility. If you are hired by management, workers may feel that they have nothing to gain by participating in your study, and potentially a great deal to lose, in terms of job security or responsibility. To make matters worse, you may not know all of the motivations behind the study: management might, in fact, be hoping to use the results of your work to build systems that change how work is done. Finally, you may be given an initial goal and problem description that is too narrow or inappropriately focused. Given all of these challenges, what strategies might you use to work with both employees and management to build the trust and participation necessary for conducting a methodologically sound study?

10. Working closely with research participants raises questions of trust regarding material that should or should not be included in a study. Particularly when working closely with an individual in a home or workplace setting, you may

see or hear things that might be both very interesting and potentially sensitive. Examples include comments about a coworker's (or manager's) incompetence or discussion of children hiding certain behavior from parents. Although these observations may be intriguing, fear of repercussions may lead you to be wary of reporting them. How might you deal with this conflict between research fidelity and the trust of your participants?

RESEARCH DESIGN EXERCISES

1. Imagine an ethnographic study of how college students use technology to work on group projects. How would you go about designing such a study? You might say that you will pick a class that involves group work, but this is only the beginning—which courses would you consider? Which types of student? Which roles would be appropriate? What sort of data would you collect? How would your answer depend upon your status? In other words, would a college student conducting this study use the same approach as a professor?

2. Conduct a mini-ethnography. Working in a team of two or three, observe a group of people. You might observe students waiting outside a class on campus, families at a playground, friends at a coffee shop, meetings of a student group, or some other similar activity. (As this won't be a formal study, you probably shouldn't interview participants or use other data collection methods, but you can watch and listen in public places.) Write down your observations individually and try to describe what you have seen and learned. Once all group members have done this, meet and discuss your findings. Can you combine your observations and individual models to build a consensus model? Build a model that incorporates all of your conclusions and discusses differences in your findings.

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