1 | Living with Technology

As social scientists we have long given too much weight to verbalizations at the expense of images. Lived experience, then, as thought and desire, as word and image, is the primary reality.
—E. M. Bruner (1986, p. 5)

A man who works in a library is having a normal working day: checking books in and out, helping people find the author they were looking for, organizing inter-library loans, and so on. Then he receives a mobile phone text message from a friend who is visiting New Zealand. It is a short message, no more than 160 characters, yet it feels like a very personal, intimate contact—a hug or an affectionate touch. He is moved to send a reply. It is even shorter than the message he had received, and it is in a personal, intimate style not typical of him. For a moment, the two friends, though a world apart, feel intensely present to each other.

A nurse has just spent an hour caring for an extremely ill patient. Having ministered to the patient's medical needs, she sat with him for a time, encouraged him to eat some yogurt, talked to him about his family, and helped him to get more comfortable in the bed. As she walks back to her station she feels sad for the patient, who has by now become something of a friend. Still involved with that patient, she starts to write up her notes from her morning rounds, recording carefully any changes in condition and any medication that she has administered. She is comfortable doing that. It feels like a few moments quiet time reflecting on her patients, how they are, what she is doing, and what more she can do for them. But now she must enter the relevant patient movement and bed management data on the hospital's information system. Which patients are moving to another ward in the hospital? Are any patients due to move into this ward?

Who is due to be discharged? Who is due for a procedure in the next 24 hours? Bed vacancies? What drugs have been administered, and to whom? It takes only 10 minutes twice a day, but this really frustrates her. She feels she is being taken away from her patients. This is time she could be spending with them. She feels this information system has nothing to do with her work.

A father comes home from work. As he rushes into the hall, he keys in the password to disable his house alarm. His daughter comes in behind him. He needs to get the dinner prepared, so he switches on the computer in the study for his daughter and sets up her favorite game for her. Once she is settled in, he goes to the kitchen, prepares the food, and places it in the oven. He listens to his phone messages while doing this. Eventually he sets the temperature and timer and leaves the food to cook. As he passes down the hallway to the sitting room, he pops his head into the study. His daughter asks him to play with her. "Back in two minutes love." In the sitting room, he programs the VCR to record a drama that he and his wife want to watch later. Now he is heading for the study to play his daughter's computer game with her.

The Experience of Living with Technology

We don't just use or admire technology; we live with it. Whether we are charmed by it or indifferent, technology is deeply embedded in our ordinary everyday experience. Arnold Pacey noted in his 1999 book *Meaning in Technology* that academic and professional comment on technology resists discussion of personal experience. It seems too subjective. But as we have seen in the vignettes above, our interactions with technology can involve emotions, values, ideals, intentions, and strong feelings. According to Pacey, much academic framing of technology plays down this side of the relationship between people and technology in favor of something more objective, on the basis that objective analysis is required to advance theory and change practice.

Although there is an overlap, our interests in technology are narrower than Pacey's. Whereas Pacey ranges from industrial and scientific to military technologies and from architecture to civil engineering, our interest is in relationships between people and interactive technologies or information and communication technologies. Aspects of these relationships have

been addressed by research and practice in areas such as Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW) since the late 1960s and the mid 1980s respectively. In recent years there has been a perceptible shift in nomenclature toward Interaction Design or User Experience Design when referring to relationships between people and interactive technologies. This reflects a broadening of focus from computers to a wide range of interactive technologies and from work-related tasks to lived experience. At least in some quarters, then, academic and professional comment on relationships between people and interactive technologies is open to discussion of experience. The web sites of many computer and mobile phone manufacturers promote their attachment to ensuring that their technologies enrich user experience. Books about the Internet are as likely to consider how people have appropriated it and made it part of their relationships and activities as they are to consider the technical accomplishment that it is. Indeed, in HCI, the profile of experience seems constantly on the rise. For example, Ben Shneiderman (2002, p. 2) has recently argued that we are entering an era of "new computing": "The old computing was about what computers could do; the new computing is about what users can do. Successful technologies are those that are in harmony with users' needs. They must support relationships and activities that enrich the users' experiences."

The vignettes at the beginning of this chapter speak to the ways in which interactive technologies have become part of our ordinary everyday experiences at work and home. We recognize them and identify with them. We know those moments in our own interactions with technology. The vignettes draw attention to the importance of experience in each person's interactions with technology and raise the question of whether the technology supports relationships and activities that enrich experience.

The hospital information system does not enrich the nurse's experience. In fact, it takes her away from what she finds meaningful and rewarding in her work. The problem is not so much the time involved in recording data on the information system, as it is the experience of being pulled out of the world of relationships and activities that is nursing for her. Her commitment to nursing centers on the experience of nurturing and caring relationships with patients. She may well put up with inadequate pay and difficult working conditions as long as *they* leave her to get on with what she got into nursing for, caring for patients. For her, caring for patients

involves really getting to know them, spending time with them, and looking after them as people. By focusing on management and on the financial aspects of ward activities, the hospital information system requires her to treat the people for whom she cares as bits of information. This fractures her experience of nursing.

The father returning home from work interacts with a variety of technologies that are part of the prosaic experience of home life for many in the Western world today. People are used to videos and remote controls and have become blasé about bar-code programming of their VCRs and rewinding precisely to the start of a TV program. Security alarms have become incidental to the owners. Timers in cookers, caller ID on telephone displays, electronic maps and navigation systems in cars, digital cameras—all enchanting when new, all ordinary and invisible now. Unlike the hospital information system for the nurse, these technologies do not take the father out of the relationship with his daughter and the household activities that are most important to him at that time.

The computer is probably still the most obvious expression of the increasingly pervasive nature of technology for those of us who can remember how difficult it was to get our hands on a computer in a university in the 1980s. However, as desktop computers have become commonplace in many homes, the initial excitement and playfulness that we experienced with computers is reserved for particularly enchanting applications or product designs.

Shneiderman and other commentators point to mobile phone text messaging, electronic mail, and Internet chat as technologies that succeed in supporting relationships and activities that enrich the users' experiences. Shneiderman argues that they have been as successful as they have because they provide people with alternative ways of doing what they already love doing: communicating. They augment people's ability to communicate and fit in with a value system that treats communication and relationships as important. This may not sound like a convincing argument to readers who see teenagers absorbed in text messaging and assume that they are wasting their time or (worse) actually diminishing their ability to "really" communicate. But studies that look closely at the teenage experience of text messaging do not support such skepticism.

Many studies of mobile phone use and text messaging describe the teenage experience with these media as expressive and creative (see Katz

and Aakhus 2002, for example). Teenagers put a lot of effort into composing short messages that convey precisely what they feel and what they think will be understood by the recipient. They seem to evoke the other person, how that person thinks and feels, while composing a message. The constraints of the medium and teenagers' desire to express themselves clearly make text messaging very personal for them. They collect personally significant messages to evoke the moment they were received, to recall, and to reminisce. Some are reluctant to give up their old mobiles for a newer model because the old model holds messages that are dear to them. A downloaded or handwritten version would not do. The phone, display, and format of the text and the sensory activity of holding the phone and calling up a particular message all help to evoke the original moment. They are like the wrapping and the card signifying that an object is a special gift—put away in a drawer, come upon every now and again, always evoking that moment. The enchantment of technology. And yet a prosaic experience for many teenagers and adults.

We live with technology and, as commentators and practitioners, we must consider the implications for theory and practice. We see some of the implications at least being tabled in the emergence of a marketing concern for "user experience" among manufacturers and distributors of interactive technologies. We also see it in research attempts to define and measure user experience. However, as there is little history of interest in experience in HCI and related research areas, we suggest that a pause for reflection is needed lest we all jump on a marketing bandwagon without knowing what we are getting into. Although HCI research and practice is already moving toward experience as a response to the need to deal with technologies that we live with, there is now more than ever, a need for clarification on what we mean when we talk about experience of technology.

HCI and the User Experience

It is no longer considered sufficient to produce a computer system that is effective, flexible, learnable, and satisfying to use—the characteristics of usability according to Shackel (1990)—it must now also be useful in the lives of those using it. The hospital information system mentioned above may have been technically state-of-the-art and may have been highly usable, but it was not experienced as useful by a nurse who wanted to get

on with caring for her patients. In contrast, the tools for text messaging in many mobile phones would win no prizes for usability, yet text messaging is experienced by many adults and teenagers as instrumentally and expressively useful (Katz and Aakhus 2002). It augments people's ability to organize complex and busy work, family, and social lives. For many it also provides an opportunity to express themselves, their feelings and emotions, in ways not previously available to them.

Experience of technology refers to something larger than usability or one of its dimensions such as satisfaction or attitude. However, HCI and related disciplines are not used to dealing with experience. HCI grew out of collaboration between the disciplines of computer science and psychology, the academic aspects of both of which are more comfortable with the laboratory than the outside world, and directed more toward functional accounts of computers and human activity than toward experience. Against this background, it might be worth looking briefly at the emergence of interest in experience with technology and how HCI currently understands user experience. Kuutti (2001) characterizes the history of "the user" in HCI. The user started out in the 1970s as a cog in a rational machine, became a source of error in the 1980s and then a social actor in the 1990s, and is now a consumer.

The User as a Cog in a Virtual Machine

During the 1970s and the 1980s the dominant approach to understanding relationships between people and technology assumed a single user sitting in front of a computer screen and keyboard performing a fairly well prescribed task. In terms of attempting to develop a science of human-computer interaction this could be seen as a sensible place to start. It contained within it the scientific virtues of reduction and generalization, assuming that this human-computer system captured the essence of what it was like for any person to interact with any computer. Its simplicity also made it a good model for engineering HCI systems. It also had face validity in the business context, as the single-user approach matched the management style in many offices and factories where workers were assumed to use computers to execute their individual part of the work of the office. In this context, the computer was seen as a tool through which set work was accomplished. Underlying the scientific and organizational reduction was a model of the structure of action that was a deliberate simplification of action.

Instantiations of this class of cognitive model of action can be found in Card, Moran, and Newell's (1983) GOMS model and in Norman's (1988) seven stages of action. Norman's seven stages included one for goals, three for execution, and three for evaluation.

Donald Norman was very careful to describe his model as approximate. It was a useful model for answering the kinds of questions that Norman thought were central to understanding how people interacted with the objects of the world, including interactive technologies. For him, what was central was what makes something—e.g., threading a film projector, sending a text message, or editing a spreadsheet—difficult to do. Norman was well aware of the limitations of the model. In hindsight we can now read his critical evaluation of the model against the character of everyday activity as prescient of where the study of human-computer interaction would go after it appropriated the relevant aspects of the cognitive science that informed Norman's model. In his critique, he pointed to the opportunistic aspects of everyday activity:

For many everyday tasks, goals and intentions are not well specified: they are opportunistic rather than planned. Opportunistic actions are those in which the behavior takes advantage of the circumstances. Rather than engage in extensive planning and analysis, the person goes about the day's activities and performs the intended actions if the relevant opportunity arises. (Norman 1988, pp. 48-49)

As long as we stay with performance criteria and the planned actions of individuals, Norman's model of action is a very useful resource in specifying what makes something difficult to do or error prone. However, if our interests include how people feel about sending a text message, what participating in text-messaging culture does for their sense of self, and what values are implicated in texting, then Norman's model is seen to be lacking.

The User as a Social Actor

During the late 1980s and the 1990s the opportunistic or contingent aspects of everyday activity became the central focus of challenges to the dominance of information-processing psychology. These challenges came mainly from the disciplines of sociology and anthropology and were geared toward asserting the salience of the social context of activity in discourse about people and technology. One way to see this is in terms of their claims that the contingent character of everyday activity is at least as important as mental structures in shaping human-computer interaction. By moving

everyday activity to center stage, and by insisting that all action is richly contextualized, this approach began the process of promoting experience over abstraction. It fits comfortably with our vignettes of text messaging and domestic technology, and it helps explain the sense the nurse has of the technology interfering with her primary preoccupation of patient care.

Lucy Suchman and Jean Lave have been two of the most influential figures in helping to contextualize action in human-computer interaction. Their emphasis on the situatedness of action offers a radical alternative to the task-based, information-processing accounts of action characteristic of the single-user approach. For example, Suchman (1987, p. 186) argued that, in contrast with task-based frameworks where the situation is characterized as an aspect of the means to achieve ends or part of the conditions for accomplishing a goal, situations and actions are intimately linked: ". . . the detail of intent and action must be contingent on the circumstantial and interactional particulars of actual situations." For Suchman, the inherent openness of situations defies carefully planned responses, and any regularity emerges not as a result of plan-based action but as a result of local responses to contingencies.

Lave (1993, p. 7) also offered an explicitly relational account of socially situated practice insisting that people acting and the social world of activity cannot be separated: "Theories of situated activity do not separate action, thought, feeling, and value and their collective cultural historical forms of located, interested, conflictual, meaningful activity." Moreover, Lave proposes that the character of situated practice is heterogeneous and multifocal. She points to the ways in which people who constitute "a situation" know different things and speak with different interests and experience. For Lave, the unit of analysis is the person-acting-in-setting through culturally constituted resources for learning and sense making.

Although our work has benefited greatly from the way in which approaches such as Lave's and Suchman's have opened up human-computer interaction to the contingencies of ordinary everyday life, and our interest in experience has in part been primed by their work, we shall argue in chapter 2 that their approaches miss some of what we want to insert into discourse on experience of technology. While fully accepting the contingency of action, we are keen to develop a stronger sense of the felt life and the emotional quality of activity in our approach to experience. We are also keen to embed these dimensions in the sense-making aspects of experience.

Specifically, we are referring to the affection, hopes, and imagination of text-messaging teenagers and the fears, frustrations, and anxieties of the nurse obliged to use a hospital information system that cuts against her sense of who she is as a nurse. These emotional, sense-making aspects of experience seem underplayed in situated accounts of action.

Consumers and the User Experience

The 1990s saw the development of the dotcom companies and a multi-million-dollar games industry; strong penetration of computers into the home; the confluence of computer and communications technologies; and the beginnings of wireless, mobile, and ubiquitous computing. The industry vision now is not of desktop computers or even laptop computers but of information appliances and interactive consumer products that will penetrate many aspects of our lives.

Interaction with technology is now as much about what people feel as it is about what people do. It is as much about children playing with GameBoys, teenagers gender swapping, and elderly people socializing on the Internet as it is about middle-aged executives managing knowledge assets, office workers making photocopies, or ambulance controllers dispatching ambulances. The emergence of the computer as a consumer product has been accompanied by very explicit attention to user experience. For example, a leading textbook presents user-experience goals as one of the sets of goals of interaction design, related to but not subsumed by the more readily recognized usability goals:

> . . . user experience goals differ from the more objective usability goals in that they are concerned with how users experience an interactive product from their perspective rather than assessing how useful or productive a system is from its own perspective. (Preece et al. 2002, p. 19)

Though any attempt to move the industry's attention toward experience is to be welcomed, we have reservations about some of what is being offered in the name of user experience. In this area, it seems that technological development and business momentum may have outstripped reflective commentary and analysis.

Computer manufacturers aspire to designing computers as full-fledged consumer products and as part of that process they are concerned with creating the total user experience. Employing the phrase "user-experience design" as a reminder or motivator to designers to pay attention to people's

experience of technology is one thing. Employing the phrase to indicate that a particular user experience can be designed is another thing altogether. The latter suggests a return to the simplicity of a technologically determinist position on what experience is. This neglects the agency of people interacting with technology, a focus that has been hard won by the likes of Lave and Suchman. While giving those who use "experience design" and similar phrases the benefit of the doubt, it is part of the job of a book that claims to examine experience of technology to take the language of user experience seriously. For example, the Apple Macintosh Developer page defines "User Experience" as "a term that encompasses the visual appearance, interactive behavior, and assistive capabilities of software." The orientation to user experience here is technology driven. Although the authors are interested in enriching user experience, they have a technological vision of how this can be achieved. Their approach is similar to the approach described in many books on designing web site user experiences. For example, although Garrett (2002) attends to both business and user needs in his book directed at improving user experience of web sites, his attempt to resolve them depends on a conceptual integration of information design, information architecture, and interface design. Two quotations from the book illustrate his conviction that experience can be shaped or controlled by good design:

The user experience development process is all about ensuring that no aspect of the user's experience with your site happens without your conscious, explicit intent. This means taking into account every possibility of every action the user is likely to take and understanding the user's expectations at every step of the way through that process. (ibid., p. 21)

That neat, tidy experience actually results from a whole set of decisions—some small, some large—about how the site looks, how it behaves, and what it allows you to do. (ibid., p. 22)

IBM's web site contains a richer, more transactional approach to user-experience design:

User Experience Design fully encompasses traditional Human-Computer Interaction (HCI) design and extends it by addressing all aspects of a product or service as perceived by users. HCI design addresses the *interaction* between a human and a computer. In addition, User Experience Design addresses the user's initial awareness, discovery, ordering, fulfillment, installation, service, support, upgrades, and end-of-life activities.

It is not our aim to dismiss the phenomenon of user-experience design or the approach to user-experience design outlined on the web sites of some of the major manufacturers. Indeed, as will be evident in the following chapters, our own description of experience is quite compatible with the view of user-experience design proposed on the IBM web site. And we are heartened by the fact that the consumer metaphor underlying notions of user experience treats activity as emotionally laden. Klein (2000) demonstrates that consumer product branding is concerned with establishing and maintaining emotional ties, the sense of belonging or feeling of warmth that differentiates one product from another. If the HCI construal of users as consumers is taken seriously, the relationship between person and computer cannot be construed as mechanistic or as shaped by relationships with social structure alone. The consumer metaphor implies an emotional-volitional component, which is currently underdeveloped.

Our concern with the consumer metaphor and user experience in HCI is that business momentum may take a potentially rich idea and reduce it to design implications, methods, or features. There are literatures on consumer activity and experience that seem to have been missed by those who imagine that they can design a user experience. DeCerteau (1984), for example, has a framework for analyzing how consumers make use of producers and distributors. People develop their own paths around supermarkets, tactically resisting the architecture and advertisements designed to shape their shopping behavior. Consumers appropriate the physical and conceptual space created by producers for their own interests and needs; they are not just passive consumers. Klein (2000) similarly describes the potential for immunity to advertising and the anti-advertisement culture that suggests healthy resistance, and even activism, in the face of global consumer capitalism. The general point that we must remember when thinking about interactive technologies as consumer products and people who buy and use them as consumers is that consumers are not passive; they actively complete the experience for themselves.

This brief review of the history of perspectives on people and computers in HCI suggests that although interactive technology designers and manufacturers have taken a shine to the idea of user experience and consumer products, their understanding or use of experience is limited. For some of them, experience is a fuzzy concept—you know when you have had an

experience. For others, it is inherent in interface and information design and architecture, as if consumers will not make of the interface and architecture what they need and desire. The lesson of the mobile phone and particularly of text messaging that seems not to have been learned yet is that the quality of experience is as much about the imagination of the consumers as it is about the product they are using. It is our aim to fill some of these lacunae by developing an account of experience of technology that mines the rich conceptual resources already available to complement the technological and business momentum toward experience.

Toward a Deeper Understanding of Technology as Experience

Perhaps it would be useful to view interactive technology in general as an experience, even if it is sometimes an experience of indifference or resistance. This is the position that this book sets out to explore. Given the lacunae in our treatment of experience in HCI to date, a central part of our exploration is a critical discussion of the approaches to experience that are current in HCI and a characterization of experience that enables us to interpret the influence of technology in our lives. Although the detail of our position is developed through the rest of the book, we will briefly describe it here to provide an overview against which the detail can be read. The overview can be seen as a series of six propositions.

■ *Our first proposition is that, in order to do justice to the wide range of influences that technology has in our lives, we should try to interpret the relationship between people and technology in terms of the felt life and the felt or emotional quality of action and interaction.*

Klein (2000) reminds us that, in a world of signs and meanings, a Starbucks coffee is not just a coffee; it is an experience of warmth and homeliness that provides a space of belonging. Likewise, a car is not just a car, and a mobile phone is not just a mobile phone. In both cases, the color, the shape, and the manufacturer's name convey something of our selves to ourselves and to others. Apple knows that image matters to most people in some circumstances. The Powerbook G4's large screen, its lightness, and its titanium casing evoked the mobility and robustness people had always expected from a portable computer but never quite had.

On a long train journey, some people would feel lost without their mobile phones; they so need to feel connected. Others on the train become annoyed and irritated by the constant noise of phones ringing and people talking aloud to absent others. For those who get irritated, it is not the idea of people talking on their phones in a public space that is annoying. It is the sensory or physical quality of the intrusion. The noise seems to permeate a boundary. The noisier it is or the more grating the ring or the voice, the more violent the intrusion. Curiously, the emotionally and sensually absent other is also a source of trouble. People generally enjoy overhearing others' conversations, but not one side of a conversation.

As we indicated earlier when discussing the popularity of mobile phones and texting, those who love their mobiles very often do so because of their expressive quality. They keep messages sent by friends and prefer to keep an old phone rather than swap it in order to have those messages in their original state. There seems to be something about the felt and sensual quality of the phone, the snug fit, the sound of a friend's voice, the ring tone associated with a particular caller, the shape of a text message, and the pleasure of scrolling through it. For those who engage with these practices, the sensory and emotional qualities of phone and text message constitute the felt experience of calling and texting. Again it is not the abstract idea of communicating, perhaps not even the social practice, but the felt and sensual quality of the particular communication that gives it an expressive quality.

Returning to the vignettes at the beginning of this chapter, we are arguing that in order to understand the relationship between the friends texting each other across the world and their mobiles, or between the nurse and the hospital information system, we must understand what the experiences of texting and using the information system feel like for those people. We must understand the emotional response and the sensual quality of the interaction.

Because the word 'experience' already expresses the *feltness* of life for us, when we write about experience of technology we have this felt quality very much in mind. We have become used to interpretations that emphasize the *livedness* of experience in HCI, especially with the significant contribution of practice and activity theories since the mid 1980s. In this book, we prioritize feltness to emphasize the personal and particular character of experience with technology. For us, *felt* experience points to the emotional and sensual quality of experience. Our first proposition is that

these qualities should be central to our understanding of experience of living with technology.

■ *Our second proposition is that social-practice accounts of interactive technologies at work, at home, in education, and in leisure understate the felt life in their accounts of experience.*

Suchman, Lave, Susan Leigh Star, and others have convinced us that cognitive models of action are not the most appropriate models of human action for human-computer interaction. Instead of looking for an account of coherence of action in psychological processes in the head, they have convinced us to look to the particular social and physical circumstances of action and interaction for interpretations that are more relevant to understanding, designing, and evaluating interaction. Suchman's (1987) implication that the significance of artifacts and actions is intimately related to their particular circumstances has influenced design discourse since the mid 1980s. And Bowker and Star (1999) have shown how artifacts in particular situations create classifications and boundaries that raise moral and political issues. Lave's (1993) orientation toward a broad social and community context elicits questions about people's concerns, values, and identity. Lave also explicitly addresses experience and how it relates to action or practice.

Our aim is not to put ourselves in some fruitless competition with practice-based approaches. Rather, we would like to build on what those approaches have already contributed to HCI by giving a more prominent position to feltness in an account of people's experience with technology than they do. In this regard, we part company with practice-based approaches and theories when they play down the emotional and sensual quality of experience. For example, despite developing a very rich account of concerned action, it seems to us that Lave's commitment to dialectical theorizing leads her to treat experience as belonging to an analytical order different from the sociocultural order. Likewise, theoretical commitment to the primacy of circumstances and methodological commitment to *in situ* observation seem to constrain the treatment of individual differences in situated-practice accounts. We argue that this simplifies the concepts of self, person, and subject that are crucial to the reflexivity of felt experience. It may be that in order to interpret felt experience we have to inquire from the

subject what the activity felt like as felt experience entails reflection, after the event, on the personal meaning of the experience.

Diane Hodges's (1998) account of how she felt as a trainee teacher, which attempts to give due weight to both circumstances and feelings, is an example of what we aim for in this regard. It seems to us that discourse on individual differences will have to be enriched if we are to have an account of experience of technology that satisfactorily addresses questions around the presentation of self and the construction and management of identity. The starting point of Sherry Turkle's analysis of life on the Internet is that people differ in many ways, including how they integrate computers into their lives. In Turkle's research, "experiences on the Internet figure prominently"; she argues, however, that "these experiences can only be understood as part of a larger cultural context" (1995, p. 10). From our perspective, Turkle's approach is complementary to the situated action approach, its methodology focusing on the personal or felt experience in context.

It would be easy to reduce felt experience to the subjective dimension of experience. This is not our intention at all. Like Hodges and Turkle, we guard against it by seeing every situation as emotional or felt but not treating those emotions or feelings as separate from the situation. The possibility of doing this in a coherent and sustained manner is created by a pragmatist philosophical stance, about which we shall say more later.

■ *Our third proposition is that it is difficult to develop an account of felt experience with technology.*

Developing an account of felt experience with technology is difficult partly because the word 'experience' is simultaneously rich and elusive. It is also difficult because we can never step out of experience and look at it in a detached way. Experience is difficult to define because it is reflexive and as ever-present as swimming in water is to a fish. However, we argue that useful clarifications can be garnered from sources as diverse as philosophy, psychology, literature, drama, and filmmaking. Some examples of what is available should suffice to make this point.

Brenda Laurel set out to interpret experience of computers by analogy with experience of theatre, suggesting that "both have the capacity to represent actions and situations . . . in ways that invite us to extend our minds, feelings, and sensations" (1991, p. 32). Her interest in the senses relates to

her concern for action, engagement, and agency in the context of people interacting with computers. As a consequence, engagement is at the heart of user experience for Laurel. She holds it up as "a desirable—even essential—human response to computer-mediated activities" (ibid., p. 112).

In another context, we explored a filmmaker's analysis of people's experience of film in an effort to start thinking about the possibility of enchantment with technology (McCarthy and Wright 2003). In an analysis of what makes a film "grab, and hold, and move an audience," Jon Boorstin, a writer and producer of Hollywood films, suggests that the key is to understand that we don't watch movies in one way, we watch them in three ways. Each way of seeing has a distinct pleasure and magic associated with it: the pleasure of something new and wonderful, the pleasure of emotional engagement, the thrill of a visceral response (Boorstin 1990, p. 8). The point is not to try and import this analysis into human-computer interaction but to learn about the complexity of technologically mediated experience from it.

Other approaches highlight a specific quality as central to experience. For example, Ciarán Benson (1993) sees absorption as one of the pivotal characteristics of an aesthetic experience. He describes being aesthetically absorbed as a breaking down of barriers between self and object, as an outpouring of self into the object. Absorption is associated with being completely attentive, engrossed, intensely concentrated, and immersed or lost in an activity. Benson also uses the words 'entrancement', 'enchantment', and 'bewitchment' when describing absorption. He associates such words with connotations of pleasure, wonder, and delight.

As we mentioned, Shneiderman highlights human needs and social relations in his view of HCI and argues that technologies must support relationships and activities in ways that enrich people's experiences and their sense of togetherness. Norman (2002) places enjoyment at the center of his new analysis of design. His three-level model of enjoyment concerned with relating people's visceral, behavioral, and reflective responses to an object or product has similarities to our own analysis (presented in chapter 5) and to Boorstin's (presented above). Norman also analyses the everyday and mundane activities of customization, personalization, and personification to make the case that we are all designers and that we make products our own and come to love them or hate them.

Paul Dourish (2001) presents a close reading of philosophical ideas on embodiment in order to develop foundations for approaches to the design

of human-computer interaction that emphasize tangibility and sociality. He argues that Husserl's phenomenology has had considerable influence in turning attention to everyday experience rather than formalized knowledge, and to that experience as a phenomenon to be studied in its own right. For Dourish, embodied phenomena occur in real time and in real space, are concrete and particular, and gain their meaning through participative status as objects in felt experience.

■ *Our fourth proposition is that pragmatist philosophy of experience is particularly clarifying with respect to experience, and that the models of action and meaning making they encompass express something of felt life and the emotional and sensual character of action and interaction.*

Pragmatism also sees knowledge as participative. According to this view, any knowledge we have is dependent on the technology, circumstances, situations, and actions from which it was constructed. It is knowledge in a community of engaged people, in a situation, from a perspective, felt, and sensed. For pragmatists, therefore, knowing, doing, feeling, and making sense are inseparable. Pragmatism is a practical, consequential philosophy, a practice that is concerned with imagining and enriching as much as understanding. The test it sets itself is to improve things.

Richard Coyne (1995) argued that pragmatism is the operative philosophy of the computer world, and that designers and developers are more likely to be influenced by Marshall McLuhan and John Dewey than by Bertrand Russell and A. J. Ayer. They are more likely to talk about freedom, community, and engagement (the language of pragmatism) than about formality, hierarchy, and rule (the language of analytic philosophy). We have found the ideas of one mainstream pragmatist (John Dewey) and those of another whom we position as a pragmatist though he would not be universally considered so (Mikhail Bakhtin) to be particularly clarifying in our attempts to conceptualize felt experience.

For Dewey, experience is constituted by the relationship between self and object, where the self is always already engaged and comes to every situation with personal interests and ideologies. Dewey's perspective on human action—the key to understanding felt experience—is that action is situated and creative. There can be no separation of means and ends in a world where people are always already engaged, rather people create goals and the

means to achieve those goals in the midst of their engagement with the world. Dewey's model of action is not unlike the way we think of children at play, free to define and redefine ends and means, even to redefine the situations in which they find themselves. For him, action is emotional, volitional, and imaginative, and experience is a process of sense making.

Bakhtin, a philosopher with a more literary bent than Dewey, emphasizes the emotional-volitional quality of experience and relates it to an account of everyday meaning making that is aesthetic and ethical. In this context he highlights the particularity of everyday experience, the way in which the emotional-volitional quality of a particular activity in a particular context shoots through felt experience. For Bakhtin, the unity of felt experience and the meaning made of it are never available *a priori* but must always be accomplished dialogically. It always occurs in the tension between self and other. I make sense of my self only in terms of how I relate to others and to my own history of selves—the way I was and the way I would like to be. Collapsing the traditional distinctions between speaker and listener, between reader and writer, and between tools and results, a dialogical perspective on sense making orients us to the idea that meaning is a process of bringing together different perspectives and, in this creative bringing together, forging understanding. Bakhtin refers to this as *creative understanding*.

■ *Our fifth proposition is that the importance given to the emotional-volitional and creative aspects of experience in pragmatism prioritizes the aesthetic in understanding our lived experience of technology.*

According to Dewey, aesthetic experiences are refined forms of everyday, prosaic experience in which the relationship between the person (or people) and the object of experience is particularly satisfying and creative. Note that, in contrast with analytical aesthetics, the emphasis is on the experience, not on the formal properties of the object of experience.

Richard Shusterman (2000) has written an interpretation of pragmatist aesthetics in which he describes aesthetic experience as above all an immediate and directly fulfilling experience. He develops his argument by deliberately drawing on forms of music, such as funk and rap, that would never be considered aesthetic by those who define 'aesthetic' in terms of the formal properties of the art object. In taking this approach, he continues Dewey's project of seeing aesthetics in experience or in the particular

relationship between self and object. The pragmatist approach to aesthetics opens up for us the possibility of aesthetic experience in work, in education, and in interaction with technology, not just in interaction with high art objects. This brings us back to Shneiderman's description of New Computing as supporting "relationships and activities that enrich the users' experiences." In Dewey's terms, this is an aesthetic aspiration for computing. For Shusterman (ibid., pp. 55–56), an aesthetic experience (or perhaps an enriched user experience) is "an experience of satisfying form, where means and ends, subject and object, doing and undergoing, are integrated into a unity."

Pragmatism provides tools for analyzing the aesthetic quality of felt experience in the form of, for example, Dewey's characterization of *an* experience and the internal dynamics of experience. We shall describe and use these later in the book. They are complemented by Bakhtin's aesthetics, which focuses on the struggle to achieve the sense of fulfillment that can be seen as characterized in Dewey's characteristics of *an* experience. For Bakhtin, this becomes a study of consummation of experience, the archetype of which is consummation of self in other.

■ *Our sixth and final proposition is that the revisionary theorizing of pragmatism is particularly valuable for understanding technology and design.*

Dewey criticized scientific theorizing as backward looking. By this he meant that it seeks to describe and explain the world as it is; unlike design, it does not concern itself with how the world might have been or might become. In his theorizing, Dewey was concerned to change, not to represent. When he practiced philosophy of education, he was concerned to improve educational practice. When he practiced philosophy of art, he was concerned to inquire into how prosaic experience could become as satisfying, fulfilling, and creative as possible. When we attempt to pragmatically conceptualize people's experience of technology, we are concerned with inquiring into what pragmatism has to offer toward enriching those experiences, even to the point of imagining what a rich experience of technology could be.

A revisionary theory is valued not so much for whether it provides a true or false representation of the world as for whether it helps us think through relationships between for example, people, technology, and design. It is less

concerned with representing existing relationships than with imagining new relationships and experiences. When later in this book we describe Dewey's model of action as being something like children at play, we are not suggesting that this represents human action as we have observed and known it. Rather, in the spirit of pragmatism, we are attempting to reorient the way we think about action to take account of the potential for playfulness and creativity in action. When we conceptualize technologies as experience, we are attempting to re-view technology by making visible aspects of experience of technology that would otherwise remain invisible. For pragmatists, theorizing is a practical, consequential activity geared toward change, not representation.

Some might argue that revisionary theorizing may not be as well suited to inquiry about technology as it is to inquiry about topics that are more obviously in the domain of the humanities, such as education, art, politics, and literature. However, it could also be argued that the very proposition we are testing in this book is that reflective practice on experience of technology could be well served by a humanist cast, the test of which is whether it changes readers' thinking about technology to the point where questions about the expressiveness, feelings, values, and sense of self evoked by interactions with particular technologies are as natural as questions about form and function. Moreover, it is worth recalling that both Dewey and Bakhtin were concerned with the production and consumption of artifacts. Dewey was concerned with the production and consumption of works of art, Bakhtin with the production and consumption of novels. Many of their ideas about the relationships of producer, consumer, artist, appreciator, author, reader, and character, and about the process of creative understanding, can be usefully employed in conceptualizing the relationship of designer, technology, and user.

Representational or reflective theorizing makes sense only when the "world" being explored is considered to be relatively stable. If it is considered stable, then what is important will always be important. A representation or categorization of technology, once achieved, remains valid. In contrast, when the world being explored is constantly changing, and in fact has become a byword for change (as technology has), representational theories are always chasing to catch up with the latest manifestation but one. Moreover, an important constructive dimension of theorizing is missed with the reflective stance. As technology is ever changing, it is not only reflected;

it can also be made. Cognizant of this potential, people who create new technologies adopt a revisionary or forward-looking orientation that can also be adopted by theorists whose theories are geared toward developing new ways of looking at technologies rather than reflecting past practice. In this context, theorizing becomes active intervention in which we provide a conceptual elaboration of technology that facilitates a re-orientation among designers, users, and observers. Not just any re-imagination, but one that is practically, experientially, and ethically rewarding, and that is oriented toward how technologically mediated action is lived and felt.

Plan of the Book

So far, we have sketched the position we intend to develop in this book. The remaining chapters will be used to provide more detail and to discuss in depth the issues that have been raised. Chapters 2–5 provide a detailed explanation of our conceptualization of technology as experience. In chapter 2, we clear the ground by reviewing relevant developments in HCI and CSCW since the 1980s. In so doing, we review what we have termed the turn to practice and argue that the feltness of experience has been underplayed in practice theories.

In chapter 3, we clarify what we mean by experience, outlining the pragmatist approach to experience that we employ and describing the particular contributions of John Dewey and Mikhail Bakhtin, the writers on experience who have most influenced our own thinking. In setting out the pragmatist approach to experience, we describe three defining commitments of pragmatism: the primacy of prosaic action (and, in particular with respect to Dewey and Bakhtin, the continuity between aesthetic and prosaic experience), the situated creativity of action, and the relationality or dialogicality of understanding.

In chapter 4 we ask what a pragmatist account of people's experience with technology might look like. We describe the threads of experience and then use these threads to analyze some examples of people's experience with technologies, starting with film and moving on to more interactive technologies. Whether we are watching a film, playing a computer game, or using a spreadsheet, pragmatism tells us that our experiences do not come to us ready made. Rather, as meaning-making creatures, we bring as much to the experience as the filmmaker or designer puts into it.

In chapter 5, we provide an account of the variety of ways in which people make sense of their experience, an important analytical resource in exploring relationships between people and technology.

Chapters 6–8 are in the form of short case studies about technology use that illustrate some of the ideas developed in chapters 3–5. Chapter 6 presents a personal experience of Internet shopping. Chapter 7 is based on a pilot's reflections about his experiences of procedure following. Chapter 8 is an attempt to characterize the experience of ambulance control in two different settings, one of which involves a high-tech system.

Chapter 9 pulls together some of the major strands and considers how they relate to emerging trends in HCI and interaction design.