What impact has ecological psychology had on HCI?

A main contribution of the ecological psychology approach in HCI has been to extend its discourse, primarily in terms of articulating certain properties about an interface or space in terms of their behavior, appearance and properties. As such the role of theory is largely descriptive, providing design concepts. Most significantly, it has generated core terms that have become part of interaction design's everyday parlance, namely affordance and entry points.

5.4 SITUATED ACTION

The turn "to the social" took place in the late 1980s and early 1990s as a reaction against the dominant cognitive paradigm in HCI. During that time, several sociologists proposed alternative approaches for analyzing user-interaction (see Button, 2003; Shapiro, 1994) that focused on the social aspects of work settings and technology support. Lucy Suchman's (1987) book *Plans and Situated Action* took the field by storm and was universally read by all in HCI; its impact was to have a profound effect on how computation, programming, users and interface design were construed and researched. As well as providing an indisputable critique of the classical cognitive approaches, her alternative ideas about situated action resonated with many who had become disaffected with information-processing models underlying much of HCI.

The situated action *approach* has its origins in cultural anthropology. Suchman (1987) argued for "accounts of relations among people, and between people and the historically and culturally constituted worlds that they inhabit" (p71). To achieve this requires examining the relationship between "structures of action and the resources and constraints afforded by physical and social circumstances" (p179). This involves analyzing "how people use their circumstances to achieve intelligent action (...) rather than attempting to abstract action away from its circumstances" (p50). Suchman was quite clear in her intentions not to produce formal models of knowledge and action, but to explore the relationship of knowledge and action to the specific circumstances in which knowing and acting happen.

Situated Action in a Nutshell

The situated action approach offers detailed accounts of how technology is used by people in different contexts, which can often be quite different from the way the technology was intended to be used. The method used to reveal these discrepancies is predominantly ethnographic (i.e., carrying out extensive observations, interviews, collecting video and note taking of a particular

setting). Typically, the findings are contrasted with the prescribed way of doing things, i.e., how people ought to be using technology given the way it has been designed. Sometimes conversational analysis (CA) is used to interpret the dialogue and interactions that take place between users and machine. For example, one of the earliest studies, using this approach was Suchman's (1983) critique of office procedures in relation to the design of office technology. Her analysis showed how there is a big mismatch between how work is organized in the process of accomplishing it in a particular office and the idealized models of how people should follow procedures that underlie the design of office technology. Simply, people do not act or interact with technology in the way prescribed by these kinds of models. Instead, Suchman argued that designers would be much better positioned to design systems that could match the way people behave and use technology if they began by considering the actual details of a work practice. The benefits of doing so could then lead to the design of systems that are much more suited to the kinds of interpretative and problem-solving work that are central to office work.

In Suchman's (1987) much-cited study — of how pairs of users interacted with an expert help system, intended as a help facility for using with a photocopier — she stressed how the design of such systems would greatly benefit from analyses that focus on the unique details of the user's particular situation — rather than any preconceived models of how people ought (and will) follow instructions and procedures. Her detailed analysis of how the expert help system was unable to help users in many situations where they got stuck highlighted again the inadequacy of basing the design of an interactive system primarily on an abstract user model. In particular, her findings showed how novice users couldn't follow the procedures, as anticipated by the user model, but instead engaged in ongoing, situated interaction with the machine with respect to what they considered at that moment as an appropriate next action.

SA analyses have revealed that while people may have plans of action in mind, they often need to change them depending on what is actually happening in a specific situation. They use their embodied and past experiences to deal with the contingencies of the ongoing situation. The canonical example provided by Suchman (1987) is of someone going over the falls in a canoe.

"In planning to run a series of rapids in a canoe, one is very likely to sit for a while above the falls and plan one's decent. The plan might go something like "I'll get as far over to the left as possible, try to make it between those two large rocks, then back very hard to the right to make it around that next bunch." A great deal of deliberation, discussion, simulation, and reconstruction may go into such a plan. But however detailed, the plan stops short of the actual business of getting

your canoe through the falls. When it really comes down to the details of responding to currents and handling a canoe, you effectively abandon the plan and fall back on whatever embodied skills are available to you."

Following Suchman, a number of field studies were published that explored the situated and social aspects of user interaction in the work contexts they occurred. The outcome was a corpus of detailed "thick" accounts of a diversity of work practices and based on these design guidance about the specifics of the setting studied (Plowman et al., 1995). However, a criticism leveled at the situated action approach is its focus on the "particulars" of a given setting, making it difficult to step back and generalize. For example, Nardi (1996) exclaims how in reading about the minutiae of a particular field study "one finds oneself in a claustrophobic thicket of descriptive detail, lacking concepts with which to compare and generalize" (p92). This suggests it can be difficult for those used to seeing the world in abstractions to conceptualise it at such a level of detail. In an attempt to overcome this limitation, Hughes et al. (1997) proposed a generalizable framework to help structure the presentation of ethnographic findings in a way that was intended to act as a bridge between fieldwork and "emerging design decisions." The abstractions are discussed in terms of three core dimensions intended to orient the designer to thinking about particular design problems and concerns in a focused way, that in turn can help them articulate why a solution might be particularly helpful or supportive. These are "Distributed Coordination" (work tasks are performed as patterns of activity, e.g., division of labor), "plans and procedures" (the organizational support for distributed coordination, such as project plans and schedules, job descriptions) and "awareness of work" (the organization of work activities that makes them "visible" to others doing the work).

What impact has the situated action approach had in HCI?

The influence of the situated action approach on HCI practice has been pervasive. Suchman became one of the most frequently cited authors in the HCI literature. It changed the way researchers thought of computer interactions and work activities, taking context to be a focal concern. Several researchers reported how the situated action approach has profoundly changed the way they think about how they conceptualise and develop system architectures and interface design (e.g., Button and Dourish, 1996; Clancey, 1993). The situated approach has also become part of designer's talk; concepts of "situatedness" and "context" often being mentioned as important to design for. Hence, the situated action approach has, arguably, had a considerable influence on designers. Nowadays, it is increasingly common for designers and others to spend time "in the field" understanding the context and situation they are designing for before proposing design solutions (Bly, 1997).

Its contribution is descriptive, providing accounts of working practices. It has also had a big impact in the field , facilitating the widespread use of socially

oriented concepts, such as context, and inspiring the development of analytic frameworks.

5.5 ETHNOMETHODOLOGY AND ETHNOGRAPHY

Another significant contribution to the "turn to the social" was ethnomethodologically informed ethnography, where field studies were conducted of work practices and interpreted in terms of the practical accomplishment of the people involved (Anderson, 1994). Similar to the situated action approach, it was developed in HCI as a reaction against mainstream cognitive theories. As the name suggests, it is considered an approach to adopt within HCI rather than a theory *per se*.

Ethnomethodology was originally proposed as an alternative *methodology* in sociology, intended to replace traditional top-down theories that sought to identify invariant structures (Garfinkel, 1967; Garfinkel and Sacks, 1970). Such external points of view of the world were considered not at all representative of the actual state of affairs. In this sense, it has an anti-theoretical stance, being quite explicit about its epistemological origins.

Ethnomethodology in a Nutshell

Ethnomethodology is concerned with how people accomplish social order in their everyday and work settings. Social order refers to the interactional work through which people conduct themselves (Garfinkel, 2002). This is viewed as an accomplishment in how society's members craft their moment-to-moment interaction. Essentially, it views people as shaping their actions rather than their actions being shaped by their environment. Ethnographic data is collected and analyzed to reveal how this is achieved. The accounts of work practices are presented largely as thick descriptions (Geertz, 1993). By this it is meant extensive and very detailed accounts.

Within HCI, the ethnomethodological approach has provided illuminating accounts of the details of work practices through which actions and interactions are achieved. Hence, it is an approach rather than a theory. It was popularized mainly by British sociologists, who used it to analyze a number of workplace settings; the most well known were of a control center in the London Underground (Heath and Luff, 1991) and of air traffic control (Bentley et al., 1992). They can be very revealing, often exposing taken for granted working practices, which turn out to be central to the efficacy of how a technological system is being used in a setting.

They have also been used to evaluate a number of technology designs and interventions, including Heath and Luff's series of studies on media spaces,