

## Microethnography: The Study of Practices

Jürgen Streeck and Siri Mehus

*The University of Texas, Austin*

The term *microethnography*, which has come to denote the microscopic analysis of naturally occurring human activities and interactions, has a curious history. It was originally suggested by F. Strodtbeck to L. M. Smith and W. Geoffrey, two educational researchers who adopted the term to characterize their ethnographic strategy for analyzing the “complexities of an urban classroom” (Smith & Geoffrey, 1968, p. 3). Adopting E. T. Hall’s concept of the “silent language” (Hall, 1959), they intended to “describe the silent language of a culture, a classroom in a slum school, so that those who have not lived it will appreciate its subtleties and complexities” (Smith & Geoffrey, p. 2).

Smith and Geoffrey’s study was one among a handful conducted during the 1960s that sought to illuminate the shortcomings of the American educational system by adopting ethnographic methods and observing and describing what exactly goes on day by day and moment by moment inside the walls of schools (see also Jackson, 1968; Wolcott, 1973). They focused in particular on how students, teachers, and other school personnel “manage encounters” (Wolcott, p. xv). What was “micro” about these ethnographic studies, however, were the “cultures” that they described, namely, individual classrooms or schools rather than entire societies. The methods adopted were otherwise not different from those of traditional ethnography: interviewing and participant observation. Contemporary microethnography, in contrast, largely shares its methods with interactionist modes of analysis, notably conversation analysis, which concentrate on the analysis of recorded specimens of interaction, usually without consulting participants’ judgments. Microethnography finds the foundations of social organization, culture, and interaction at the microlevel of the moment-by-moment development of human activities.

Microethnography did not really come into its own until the 1970s when a few groups of educational researchers in sociolinguistics, sociology, anthropology, and education,

equipped with newly available video technology, began to collect audiovisual samples of classroom behavior and collaborated on improving the techniques of data analysis in the ethnography of communication by incorporating fine-grained analyses of microbehaviors involved in the enactment of communicative events. The term "microethnography" was introduced to this group (whose senior members also included R. McDermott, P. Griffin, H. Mehan, and J. Shultz) by Frederick Erickson (Erickson, 1971), who also labeled it "ethnographic microanalysis" (Erickson, 1995). Mehan (1978) preferred the term "constitutive ethnography" to highlight the fact that the study of moment-by-moment interaction in classrooms ultimately explains how the societal institution of school is constituted.

This collaborative effort at microanalysis of classroom behavior was much influenced by work in ethnomethodology (see especially Cicourel, 1968; Cicourel et al., 1974) and, to a lesser extent, conversation analysis (Sacks, Schegloff, & Jefferson, 1974), as well as by work in context analysis (Scheflen, 1973, 1974). Whereas these other approaches were generally more interested in analyzing the formal behavioral organization of communicative events and social action (McDermott & Roth, 1978), microethnographic studies sought to combine the study of organizational processes with the pursuit of applied issues, especially inequality, social stratification, learning, and school failure. Given that schools produce unequal educational outcomes in students from different social backgrounds, the question was how this stratification is accomplished in the moment-by-moment interaction between students and teachers. Moreover, whereas conversation analysis proceeds via the collecting of recurrent phenomena (e.g., utterance formats) across ranges of contexts to establish their recurrent functions ("doings"), the kind of work that is represented here as microethnographic typically involves case studies of a setting (e.g., a classroom) or an activity (e.g., a classroom lesson). Also, whereas microethnographers share the empiricist ethos of conversation analysis, including its emphasis on the sequential emergence of talk and action (and, thus, the need for sequential analysis), they are generally concerned with phenomena too diverse and specific to allow for the kind of generalization and systematization that are the hallmark of conversation analytic work.

There is no association of microethnographers, nor does microethnography constitute a "school." Rather, the word describes the work of humanist researchers who study how human realities are produced, activities are conducted, and sense is made, by inspecting video recordings of actual events frame by frame. In the following, we trace the development of the method from its precursors through what we call the "old school" of classroom microethnography to the "new school," by which we mean the growing field of microstudies of socially shared cognition (Resnick, Levine, & Teasley, 1991) and power, particularly in the workplace. Among our aims is to show the continuity and coherence of the microethnographic enterprise across changing topics and concerns. By precursors we mean earlier pioneering studies that contained ideas and methodology that were later taken up by microethnographers.

## PRECURSORS AND INFLUENCES

### Bateson and Mead

Many researchers who study the production of society and culture in situ and look at behavioral samples through a microanalytic lens claim one book as their sacred ancestor,

a book of almost mythical status. This is *Balinese Character* (Bateson & Mead, 1942), the fruit of the marriage of Gregory Bateson and Margaret Mead, an attempt "to communicate those aspects of culture which [may be called] its *ethos*," that is, the ways "in which the emotional life of... peoples... [is] organized in culturally standardized forms" (p. xi; see also Bateson, 1936/1958). In their view, the habitual dispositions of the members of a culture are products of social interaction. They sought to identify the character of a culture—understood as the prevailing personality type of its members—by recording and examining minute behaviors that members display in public: how they attend and disattend events, how they walk, position their hands while eating, tease their children, and learn how to dance. For the first time, anthropologists systematically attended to phenomena of such minute scale as, for example, how a person's left hand is holding a piece of paper while the right hand is writing. Significantly, *Balinese Character* is a photographic analysis of culture, probably the first of its kind and to this day the most exhaustive one; it contains 749 photographs, arranged in plates of six to eight and lifted from a collection of 25,000 that were taken in the field. (When immersed in a scene, for example a family compound in the late afternoon, Bateson typically took a roll of film every 5 to 15 minutes; p. 50.) The photographic analysis of a cultural pattern primarily proceeded through the selection of pictures deemed significant and their arrangement into small multiples, each of which constituted a "psychological generalization" (p. 51). Thus, cultural notions of respect are displayed by groups of photos of body positionings; the importance of balance as a cultural value is displayed by pictures of postures; and photos of children playing with food or touching their mouths were assumed to reflect cultural notions of body and sexuality, a theme given great importance, presumably because of Mead's Freudian inclinations.

Bateson's photographs and their arrangement also constituted one of the first attempts to exhibit the *sequential organization of interaction events*, and sequential interaction patterns were in turn regarded as the primary mechanism through which character is formed (Bateson had made similar suggestions in his observation-based study of rituals in New Guinea; Bateson, 1936/1958). Thus, studying interactions between mothers and their infants, Bateson and Mead found what they called "anti-climactic" patterns, which Bateson later conceptualized as the mode of a "culture in a steady state" (Bateson, 1949). They noticed that mothers often stimulate their infants to a state of great excitement (for example, by tickling them), to suddenly withdraw their attention before the interaction reaches a climactic point. "The give-and-take of stimulus and response between mother and child lacks the sort of climax structure which is characteristic of love and hate in our culture. The Balinese mother stimulates her child, but when he responds, she is unresponsive and never allows the flirtation to end in any sort of affectionate climax" (p. 148). What is sedimented in such interactions, presumably, is a personality disposed to avoid climactic experiences and to favor calm and balance.

In this fashion, personal traits that previously had been attributed to the individual were redefined as emergent outcomes of the patterning of interaction. Bateson understood these processes in systems terms; that is, he conceived of communicative processes as feedback systems within which each participant's contributions are determined by and, at the same time, determine those of all other participants (cf. Bateson, 1956/1972). Bateson also developed the concept of metacommunicative frames or "contexts," by which he meant classes of metacommunicative signals (e.g., facial gestures) that define

the quality of sets of messages, for example, as play, and thus establish logical premises for the conduct and understanding of talk (Bateson, 1956/1972).

This new perspective on communication and human relationships influenced what may be called the first audiovisual microanalysis (termed "natural history" by the authors) of an interaction scene, a psychiatric interview, undertaken by Bateson, McQuown, Hockett, Birdwhistell, Brosin, and Fromm-Reichmann (McQuown, 1956). In that study, an attempt was made to integrate the analysis of language and that of kinesic processes (cf. also Birdwhistell, 1970). In the absence of a worked-out methodology for the analysis of the massive amount of data that is constituted by 50 minutes of filmed interaction, however, the study has not yet led to the establishment of a new field.

### Goffman

When microethnographic research on interaction began in earnest in the 1970s, it drew much inspiration from the observation-based "micro-studies of the public order" conducted by Erving Goffman (Goffman, 1971; see also Goffman, 1959, 1961, 1963, 1974, 1981). Goffman pleaded for a framework of "interaction ethology," combining Durkheimian categories of norms of conduct with ethological perspectives in the study of ordinary human conduct in face-to-face interaction. This synthesis is particularly noticeable in Goffman's studies of everyday rituals ("supportive interchanges" such as greetings and "remedial interchanges" such as apologies). The phenomena and their analysis are derived from ethological studies of animal behavior (see especially Huxley, 1966), but they are interpreted in light of sociological theories of social order. Goffman's suggestion to study "situations and their men" rather than "men and their situations" has provided communication research with a radically sociological viewpoint: Instead of explaining social goings-on in terms of individual motives and dispositions, individual behavior (and, to an extent, motives and dispositions) were explained by reference to irreducibly social, interactional processes. His descriptions of ritual idioms by which social order is maintained and made recognizable in social encounters, and his analyses of organizational frameworks for interaction, including studies of focusing (1963), framing (1961, 1974), acquaintanceship and involvement (1969), greetings (1971), gender display (1976), and the framing of talk (1981), have made an impact on our understanding of social conduct that can hardly be overestimated.

Although microethnographers and conversation analysts have sometimes been critical of Goffman's reliance on observations unsupported by any data-recording technology—or even on literary sources—his concepts for the analysis of interaction have been and remain widely used. He especially continues to inspire new generations of researchers by making it apparent to them how much is there to be found and understood in the microcosm of human interaction.

### Scheflen and Kendon

Bateson's system-theoretical approach to communication and his ideas on context and metacommunication became centrally important to the work of the psychoanalyst and interaction researcher Albert Scheflen (1973, 1974), who called his methodology "context analysis" and whose research, like that of his predecessors, studied interaction

in therapeutic settings (Scheflen, 1973; Scheflen, 1963). Scheflen defined communication as "a means of regulating transactions of all types of behavior and maintaining social order and control" (1974, p. 4) and identified meaning as a "relation between an act and the context in which it regularly occurs" (p. 14). Scheflen discovered the framing or bracketing function of postural configurations and the marking of junctures between phases of encounters by postural shifts and pointed out that participants in interaction display their interpersonal relations in the ways in which they orient and position themselves towards one another. Whereas Scheflen emphasized the cultural patterns and gestalt-like qualities of postural configurations, Adam Kendon (who collaborated with Scheflen) focused his attention on the microinteractional spatial and kinesic maneuvers by which configurations are achieved and sustained (Kendon, 1977), that is, on the moment-by-moment processes of "frame attunement" and change (Kendon, 1990). Scheflen, in other words, began his analyses with the achieved *structures* of interaction events and their hierarchical embedding (e.g., recurrent postural configurations), whereas Kendon zoomed in on the smaller scale dynamic actions, such as barely noticeable posture shifts from which larger scale units of communicational structure are built.

### Ethnomethodology

The influence of ethnomethodology on microethnographic research was considerable, but varied between groups of researchers. Ethnomethodology was an enterprise of its own, brought about by a radical departure from traditional, normative sociological conceptions of social order. It also articulated and galvanized a more widespread interest in processes at the microlevel of social organization and the hope that close analysis of these microprocesses would yield viable explanations of what holds the macro together, namely, societal structures such as class, status, and power relations. Interest in the *production of social order* was critical to microethnographers. To varying degrees, they also adopted what one may call the consensualist perspective on social order that is characteristic of ethnomethodology, namely, the notion that the methods by which social situations are produced are identical with those by which the participants make them intelligible for one another. In Garfinkel's words, "the activities whereby members produce and manage settings of organized everyday affairs are identical with members' procedures for making those 'settings accountable'" (Garfinkel, 1967, p. 1). This perspective is visible, for example, in the work of McDermott, discussed later, who regarded postural configurations as the embodied display of participants' working consensus (McDermott, Gospodinoff & Aron, 1978).

Microethnographers also operated under the somewhat incongruous influence of structural linguistics and its reflections in fields such as cognitive anthropology (Frake, 1964). The linguist Pike had distinguished etic and emic descriptions of cultural events, in analogy to the distinction between phonetic and phonemic description in linguistics (Pike, 1966): An *etic* description captures the objective, observable features of a language sound (or other cultural event), and *emic* description captures its significance within the language (culture). When we read the work of microethnographers to trace its development over time, we notice an increasing detachment from such structuralist-linguistic conceptions, a movement from issues of *form* to issues of *dynamic action*.

A focal concern for ethnomethodology had from the outset been the local, interactive production of *bureaucratic facts*, such as the transformation of situated encounters between policemen and juveniles into criminal cases (Cicourel, 1968) or the production of patient files by clinic personnel (Garfinkel, 1967, chap. 6). Cicourel had directed a project about students' and teachers' commonsense reasoning during classroom lessons and educational testing, as well as about the "ad hoc practices" by which students are sorted into diagnostic or achievement categories (Cicourel et al., 1974; see also Mehan, 1991, 1993). This project (in which H. Mehan participated) was one of the direct precursors of classroom microethnography, and the interest in the sorting of students into categories remained one of its focal concerns.

### THE OLD SCHOOL: THE SOCIAL ORGANIZATION OF BEHAVIORAL CONTEXTS

The central research question that microethnographers of the old school sought to answer was how communicative events (classroom lessons or their constitutive parts, e.g., sharing time) are generated from moment to moment by their participants. Any ethnography that aims at an account of natural samples of behavior in terms of members' categories and cultural definitions begins with the question, "What is going on here?" Whereas cognitive anthropologists had suggested "one way to begin to investigate ethnographically 'what's going on?' [in an event, J. S. & S. M.] is to investigate the group members' knowledge of events" (Agar, 1975, p. 46), for example, by interview techniques, microethnography begins with the insight that in any event in which they participate, the question "what is going on?" is also and continuously relevant (and perhaps problematic) to the parties—as well as quietly answered by them. Goffman (1974, p. 8) noted, "I assume that when individuals attend to any current situation, they face the question: 'What is going on here?' Whether asked explicitly, as in times of confusion and doubt, or tacitly, during occasions of usual certitude, the question is put and the answer to it is presumed by the way the individuals then proceed to get on with the affairs at hand." To be able to proceed in a coherent, concerted, and intelligible fashion, participants must find shared answers to their continuing What's going on? questions, which means that they also must continuously keep each other informed as to what it is that they are doing together. The working consensus about the definition of the situation must therefore be publicly available to participants and researchers alike (McDermott, Gospodinoff, & Aron, 1978).

There is a close similarity in the primary problem facing ethnographers and other persons engaged in everyday life. This problem, common to both, is the necessity of achieving a working consensus about what is going on in any scene available to their senses. . . . people manage concerted activity only by constantly informing and conforming each other to whatever it is that has to happen next. . . . The ethnographer's. . . account of what natives do together must follow from the way in which the natives structure a situation to allow their participation with each other from one moment to the next. The ethnographer must articulate the same hesitant and momentary contexts that the natives are displaying to each other and using to organize their concerted behavior. . . . We can use the ways members

have of making clear to each other and to themselves what is going on to locate to our own satisfaction an account of what it is that they are doing with each other. In fact, the ways they have of making clear to each other what they are doing are identical to the criteria which we use to locate ethnographically what they are doing.

Accordingly, microethnography focused on the ways in which participants display contexts to one another through *embodied actions* such as gesture and postural configurations.

### THE NEW SCHOOL: OUTDOOR PSYCHOLOGY AND PRAXELOGY

Old-school microethnography, then, studied the methods by which events are organized; how different frames within events are defined and manifested in both talk and movement (Erickson & Shultz, 1982; Streeck, 1983, 1984); how participation is regulated (Philips, 1974); how institutional activities and tasks are accomplished within encounters (Mehan, 1979, 1985); and how success and failure (e.g., in schools) are produced through the ways in which situations of face-to-face communication are structured (McDermott & Gospodinoff, 1979). However, by the early 1980s, attempts were also being made to combine studies of behavioral organization with the theoretical concerns of cognitive science, to bring together research into the cognitive foundations of social conduct in the individual with studies of the interactive contexts within which cognitive competencies are put to use. Gradually, and under influences from both cognitive science and Marxist conceptions of work, social structure, and social reproduction, a new framework evolved that continues the pursuit of the concerns and modes of investigation characteristic of the old microethnography, but with a stronger focus on the intertwining of cognitive and social aspects of human activities. In the widest sense, this new orientation constitutes a framework for the empirical, ethnographic study of human practices.

At first glance, what we will term the "new school of microethnography" is simply a large body of microanalytic research that has appeared in recent years and that investigates the relationships between cognition and communication in everyday life settings such as workplaces. There is no single name for this kind of work, and its motivations and focal interests are diverse. Labels associated with it include "cognition as practice," "communities of practice," "workplace studies," "activity theory," "distributed cognition," and "cognitive ethnography," among others. What drives this work more than anything else is the recognition that cognitive processes do not take place exclusively—not even in the first place—inside people's heads, but in the outside world. Furthermore, cognitive processes involve not only brains but also artifacts and cooperation among people. What is required therefore is "outdoor psychology" (Geertz, 1983). In other words, cognition is not a private process but a collection of social, public, and interactive *practices*, practices that have evolved over time in specific, historical, sociocultural contexts; cognition is only secondarily a "private" affair, a family of activities that can also be carried out "in the head" (Ryle, 1949). Although work in this broadly defined field is inspired by a number of sources and there is considerable variety in the methods applied, a large number of researchers subscribes to the methodological credo that characterized old-school microethnography

as well: Human activities must be studied in a microscopic, moment-by-moment fashion and with attention to the sequential progression of interactional processes within which they take place.

The new outdoor psychology developed under the influence of the so-called socio-historical school of Soviet psychology (Luria, 1976, 1979), especially the work of Lew Vygotsky (1978), which was discovered by American cultural psychologists, notably Michael Cole (1996) and James Wertsch (1981, 1991). Because the work of Michael Cole (1996; Cole & Scribner, 1974) had also exerted a defining influence on the work of the old-school microethnographers, especially Ray McDermott and Hugh Mehan, there is a direct line connecting the microethnography of classrooms of the 1970s with today's outdoor psychology. What Cole and Scribner discovered in their studies of the cognitive abilities of indigenous people in West Africa, notably the Vai of Liberia, was that the shape of cognitive competence depends on the type of labor that a culture's members routinely perform and the medial resources that they use in it (e.g., writing and numbering systems). Critical to this new approach to cognition was not only the (Marxist) understanding that human abilities and functioning are components of and evolve in societal practice and are shaped by societal conditions, but also that cognition makes use of "psychological tools" (Bodrova & Leong, 1996) such as words and grammatical structures, as well as culturally constituted methods of counting, computing, and so on. To understand the human mind, we must study human intelligence *at work* (Scribner, 1984).

Several synergistic developments in a variety of disciplines have converged to open up this new field. An increasing number of psychologists recognized that cognitive skills are often difficult to assess under laboratory conditions. For example, "Micronesian navigators who show phenomenal skills in memory, inference, and calculation when traveling from island to island perform abominably on standard tests of intellectual functioning" (Rogoff, 1984, p. 2; see also Gladwin, 1970). Because the ecological validity of studies of cognitive functioning conducted under conditions of "captivity" is always questionable, a rapidly growing number of researchers began to study, in Hutchins' words, "cognition in the wild" (Hutchins, 1995), that is, in everyday life settings such as grocery stores (Lave, Murtaugh, & de la Rocha, 1984), tailors' shops (Goody, 1989), and airline cockpits (Hutchins & Klausen, 1996). The gulf between people's routine cognitive achievements in everyday life and their often poor performance under laboratory conditions is evidence of the fact that, as Norman put it, "the power of the unaided mind is highly overrated" (Norman, 1993a, p. 43). Cognition, in other words, needs to be studied with the methods of anthropologists, linguists, and communication scholars—cognition *always* in some way involves language and social interaction.

We believe that the various research networks that have emerged and that together constitute this new outdoor psychology ultimately all result from a single event, the encounter (and subsequent marriage) of American cognitive psychology with historical materialism. Typically, the new orientation of this strand of cognitive science is attributed to the influence of the work of Vygotsky on language acquisition and concept formation, because it led to the reconceptualization of cognitive processes as sociohistorically situated practices. But the intellectual foundations of Vygotsky's (and Luria's) enterprise were really laid much earlier by Marx himself, in those writings in which he investigated the intertwining of forms of consciousness with productive labor and suggested that we produce through

our own cognitive activities the very tools with which we understand the world. These activities and these tools, however, are part and parcel of productive work—the making of things—of the "metabolism" of humanity and nature (Marx & Engels, 1846/1960).

At the center of the old school of microethnography was the concern with social organization—of behavior, social aggregates (groups), and events (rituals, classroom lessons, etc.), and the phenomena studied were more or less exclusively behavioral ones: speech and body motion. New-school microethnography has considerably expanded the range of phenomena studied, and also that of the questions posed. The importance of the material setting as a *resource* and *medium* of interaction and sense making was discovered: We not only communicate with our voices and bodies but also with material objects. Some objects are specifically designed for purposes of communication (e.g., writing and other inscriptions, instruments, and so on), others are adapted for this purpose only secondarily (e.g., when we gesture with the tools and materials with which we currently work). Consequently, cognition was seen as located "in the world" (Norman, 1993b), as a socially shared process involving not only people but also, and importantly, "cognitive artifacts" (Norman, 1993a). This is perhaps most clearly visible in workplaces, given that collaborative work often requires that the participants think together to work together, something that is possible only through the mediation by material practices and artifacts (see Engeström, 1992; Engeström & Middleton, 1996). Communication, in turn, not only comprises talk and gesture, but also manipulations of the world at hand that are aimed at making this world transparent and intelligible. Processes of shared cognition are in part shaped by the social organization of the team (access, power, modes of reciprocity, and so on; Hutchins, 1991).

Thinking, learning, and other activities hitherto considered mental have thus been reconceptualized as social practices. The notion of cognition as practice is central to the influential work of the educational psychologist Jean Lave (Lave, 1988; Lave & Wegner, 1991; Chaiklin & Lave, 1993), who is generally credited also with introducing the concept of communities of practice. The idea is, as Hanks writes in his foreword to Lave & Wegner, that "learning is a process that takes place in a participation framework, not in an individual mind. . . . It is the community, or at least those participating in the learning context, who 'learn' under this definition. Learning is, as it were, distributed among co-participants, not a one-person act" (p. 15).

What is of particular interest about this new line of research is that cognitive functions, previously conceived as formal or technical functions of abstract but machinelike individual minds, were reconceptualized as "inter-mental" functions, that is, as socially shared, tool-saturated practices, which are only secondarily interiorized by individuals, within contexts of interactional participation. The entire range of psychological functions or cognitive activities can thus be re-situated and studied as they occur in our dealings with one another and with the worlds that we inhabit and make. Conceived as *cultural practices*, cognitive functions can be seen to depend on cultural, historically evolved cognitive tools (e.g., languages, numbering systems, etc.) even when they are carried out by lone individuals.

A broad range of cognitive practices has thus been investigated with microethnographic methods. These include *perception*: for example, Charles Goodwin has investigated how professionals learn to make perceptual discriminations (e.g., between shades

of color) that are recognized within their communities and how they acquire and use classificatory grids (Goodwin, 1993, 1994, 1996; see also Coulter & Parsons, 1990). Charles and Marjorie Goodwin have also investigated the practical nexus between perception and formulation, that is, how "what can be seen" is contingent on "what can be said" (Goodwin & Goodwin, 1996). These studies demonstrate that "what there is" is not only constituted through linguistic practices (as linguistic philosophy had contended; Quine, 1953), but also through embodied, practical, prelinguistic discriminations. Symbolization, so central to the human form of existence (Goodman, 1978), is an embodied kind of activity and interwoven with other forms of human praxis within embracing processes of economic, social, and cognitive reproduction (Bourdieu, 1977).

Critical to all studies of cognitive practices conducted in a microethnographic vein is the analysis of the interplay of *context* (including both activity and setting), *interactional participation*, and *cognitive tools*, in addition to mental activities, symbolization, and communication. Goodwin, in his analysis of the "professional vision" of archeologists and other experts (Goodwin, 1994, pp. 626–628), writes:

Talk between coworkers, the lines they are drawing, measurement tools, and the ability to see relevant events . . . all mutually inform each other within a single coherent activity . . . [And] the ability of human beings to modify the world around them, to structure settings for the activities that habitually occur within them, and to build tools, maps, slide rules, and other representational artifacts is as central to human cognition as processes hidden inside the brain. The ability to build structures in the world that organize knowledge, shape perception, and structure future action is one way that human cognition is shaped through ongoing historical practices.

The main novelty of these studies is perhaps the dismantling of the conceptual distinction between cognitive processes, communication, and physical action. Whereas in traditional psychological research, thought was typically conceived as a precursor or precondition for intelligent action and communication was regarded as a mere transfer of thought, within the new praxeological framework the partial identity or interpenetration of cognition, communication, and action is emphasized. It is now understood that thinking and imagining can be done with eyes and hands (Latour, 1986), as well as material objects at hand (Keller & Keller, 1993, 1996b). The cognitive scientist D. Kirsh coined the term "epistemic action" to refer to physical (often spatial) actions by which humans facilitate the enactment of activities that make multiple and complex cognitive demands (for example, on memory and computation skills). Objects are sorted into piles, for instance, that embody categorical distinctions, or they are arranged in ways that support cognitive acts such as visual scanning and comparison (Kirsh, 1995a, 1995b). Again, these actions are not the external result of inner thought; they are part of the very thought process that they support. Similarly, collaborative action and distributed problem solving in the workplace are contingent on the transparent cognitive organization of the setting (Suchman, 1996). Local environments made up of props such as tabletops, legal pads, and other objects—as well as the scenic arrangements that we create with them—can support our cognitive processes; but they can also serve as running commentaries on

our interaction. They constitute scenic resources by which we can represent our current "working consensus" (Streeck, 1996).

The most comprehensive of such studies and now a classic is Hutchins's cognitive ethnography of team navigation on a large ship (Hutchins, 1995). Hutchins squarely positions the team, rather than the individual, along with the technologies and practices that it uses, as the subject of cognitive processes. He pays much attention to the exact ways in which cognitive technologies, including compass, charts, slide rules, and so on, incorporate the knowledge of previous generations of navigators and enable current practitioners of the craft to off-load cognitive tasks from the brain to the external world. But he also emphasizes the specific affordances that human beings (Hutchins refers to them as "soft tissue") possess, compared to other instruments within such systems. Hutchins regards cognition as the propagation of representations across representational media within a social organization. His book presents a fully worked out alternative to the disembodied and immaterial view of cognitive process that is characteristic of most cognitive science, and it also exemplifies the grounding of this alternative in a historical-materialist conception of cognition.

The study of cognition and communication at work that grew out of the new microethnographic outdoor psychology intersects with a line of ethnomethodological research conducted after its heyday in the 1970s, namely, the study of scientific work, especially laboratory work (Knorr-Cetina, 1981; Knorr-Cetina & Mulkay, 1983; Latour & Woolgar, 1986). This includes investigations of discursive practices (e.g., Lynch, 1985a; Roth & Barrett, 1990; Woolgar, 1988); the organization of embodied laboratory practices (Lynch, Potter, & Garfinkel, 1983); and the production of evidence, notably visual evidence (Amann & Knorr-Cetina, 1990; Lynch, 1985b), among other aspects of scientific work.

These studies of science were to a considerable extent influenced by the existential phenomenology of Martin Heidegger, especially his thesis that our pretheoretical practical coping with the world and our manipulations of material objects are the most basic and indispensable forms of knowledge, from which all forms of observational, scientific, and theoretical knowledge are derived (Heidegger, 1926/1962; see also Heidegger, 1967; Dreyfus, 1991). The practitioners of this line of research share the view that the scientific status of "facts" does not reside in any correspondence between reality and representation, but is produced through the methodical enactment of discursive and demonstrative practices agreed on by the community of practitioners.

It is important to keep in mind that all cognitive and communicative tools that human beings employ are themselves produced by human agents, sometimes during the very moments of interaction and productive practice within which they are needed. Overwhelmingly, of course, tools for cognition, communication, and collaboration—scales, logarithmic charts, methods of making diagrams—have been prefabricated; they are products of long and convoluted histories of human praxis. But occasionally, we can also witness how new cognitive-communicative tools are being fashioned by a community, invented by an individual, rapidly picked up by others, and thus made available as devices to articulate, remember, and analyze a shared, local experience (LeBaron & Streeck, 2000). This is but one way in which local practices become *sedimented* in a communicative resource or system.

The notion of sedimentation is predicated on the primacy of practice over system: Systems are the products of practical action, not abstract competences underlying it. (This idea was already important in the work of phenomenologists; Schutz, 1982; Berger & Luckmann, 1967; it has also become central to work in linguistic anthropology; Hanks, 1990, 1996a). Language especially is “a medium of habituation” and “serves to sediment routine practices, both constraining and enabling what [people] habitually . . . think, perceive, and enact” (Hanks, 1996a, p. 237). This understanding of language entails a move away from the traditional account of grammar as a system of rules. Rather, what must be shared by people to understand one another are “habitual ways of acting and evaluating actions, what Merleau-Ponty and Bourdieu called ‘habitus,’ the lasting dispositions, perceptions, and appreciations that inform action and can be changed by it” (Hanks, 1990, p. 123; see Bourdieu, 1977; Merleau-Ponty, 1962).

There is an area of human work and communication in which the fabrication of situated cognitive and communicative tools is illuminated particularly well. This is the graphic zone, the field of inscriptions (Latour, 1990). This field typically takes on the form of a single sheet of paper or a succession of such sheets; on them, graphic marks (which can be made to embody any number of concepts, relations, or ideations) are inscribed in a succession of gestural acts. In this zone—of which diagramming occupies the center—one finds material from ancient resources (e.g., geometrical symbolism) used as versatile building blocks for improvised diagrams representing landscapes, instruments, processes, and so on, that only the local participants can possibly understand; each diagram is a local, ephemeral, shared cognitive and rhetorical tool (Streeck & Kallmeyer, 2001). Locally assembled diagrams and similar representations are sometimes interpreted by concomitant constructs within another symbolism, notably words and phrases, and these multimodal, improvised methods of representation constitute the very core of the practices of various professions (e.g., engineers, designers, and landscape architects; Henderson, 1999; Suchman, 1993). Latour regards the appearance of technologies and practices of inscription as the single most important development in the evolution of science, bureaucracy, and technology (Latour, 1990). Inscriptions on flat surfaces are abstractions that can easily be transported from one place to another and combine evidence and arguments of heterogeneous provenance and order into a single sphere. Latour therefore pleads for an “ethnography of abstraction” (p. 51) centered around the study of inscriptions.

There is also a rapidly growing number of microethnographic investigations into human interactions with technologies, including information systems, an interest stimulated in part by needs on the part of technology companies such as Apple Computers and the Xerox Corporation to produce machines and software adapted to the human user (see, for example, Suchman, 1987; Button, 1993; Nardi, 1996, 1999). Closely related are studies of technology-mediated cognition and communication, for example in airline cockpits (Hutchins & Klausen, 1996) or control rooms of mass-transportation systems (Heath & Luff, 1992, 1993, 1996). This new paradigm that we have been calling the new school of microethnography has also begun to influence studies of organizations and organizational communication (Taylor & Van Every, 2000), in part in combination with studies by Karl Weick on “collective mind” in organizations and organizing as improvisational action (Weick, 1995, 1998; Weick & Roberts, 1993).

The notion, central to microethnographic outdoor psychology, that the mind is both embodied and worldly, that is, embedded within and shaped by specific local material and cognitive ecologies (Dreyfus, 1991; Hanks, 1990; Haviland, 1996; Levinson, 1992, 1996; Varela, Thompson, & Rosch, 1991; Winograd & Flores, 1986) also sparked a new interest in skills and crafts, that is, in “incorporated” genres of human knowledge (Hastrup, 1995) that are inseparable from individual human bodies and their concrete lived experiences and biographies. Human skills—what Polanyi (1958) calls “personal knowledge”—are difficult or impossible to represent or abstract as text. Nor can such forms of knowledge be transmitted. Rather, they must be acquired by incessant practice within the various frameworks of “legitimate peripheral participation” (Lave & Wenger, 1991) that we call apprenticeship (Rogoff, 1991). In these studies of craft, skilled bodily actions are conceived as cognitive acts—as material acts of thinking, analysis, conceptualization. For example, Keller, who studied the practices of blacksmiths by becoming one himself (Keller & Keller, 1996a, 1996b) conceived of the blacksmith’s manual activities as acts of thought and imagination, functionally equivalent to inner speech, but carried out through the material and experiential engagement with matter, not in the abstract void that is otherwise conceived as the mind.

### POWER, KNOWLEDGE, MICROPRACTICES

Old-school microethnography was characterized by the meticulous analysis of embodied action in particular social settings. Initiated out of a concern with large-scale patterns of inequality, microethnographers attended to the ways in which social asymmetries were produced through mundane interactional maneuvers. The more recent line of research that we have labeled new school microethnography continues the focus on bodies in action, as well as the ethnographic description of particular cultural practices and settings. These studies extend the participation framework “beyond the skin” to include the tools and material with which human minds and bodies work. Along with this has come a shift in focus from the social per se to the social as cognitive. This move may seem to lead away from the early concern with power and politics. However, it potentially can provide a new means of understanding the link between power and knowledge. Specifically, recognizing cognition as socially constituted offers a way to understand how asymmetrical social structures are produced through processes of knowledge formation.

Consider Hutchins’ (1995) study of a navigational team discussed earlier. Hutchins demonstrates how social organization—specifically the division of labor—shapes the computational properties of a work group. By moving cognition outside of the individual into the realm of the social, it becomes evident that thinking (at least some of it) takes place not within a singly focused entity but in a complex world of competing goals, shifting relationships, and struggles for position within hierarchical structures. Although Hutchins does not emphasize this point, his model provides the opportunity to develop a much richer understanding of social structure and the workings of power. His study and others like it (e.g., Lave and Wenger, 1991; C. Goodwin, 1994) reveal the interactional means through which knowledgeable persons are produced, as well as the social and material props on which such knowledge rests. This type of analysis gives us new tools

with which to explore the micropractices of thinking, working, and learning through which social order is constituted and made natural.

There has been a great deal of research on the relationship between power and language. The portion of that work that can be considered microethnographic includes those studies that apply a fine-grained analysis to the question of how social inequality is produced through interaction in situated activities. Many such microethnographic studies of power go beyond analysis of language to include gesture, the manipulation of material resources, and the organization of bodies in space. The level of attention to situated context and semiotic resources other than language marks the difference between a microethnographic approach to power and that of sociolinguistics or critical discourse analysis. An emerging potential for microethnography is to use the perspective of socially distributed cognition as a tool to examine the interplay between power and knowledge.

### **Politics and Power in Situated Sociocultural Activities**

In this section we discuss some studies in which a microethnographic approach (though usually not labeled as such by the researchers cited) is used to investigate issues of power and social interaction. This brief survey is intended to show some of the ways in which the critical perspective of early microethnography is being manifested in more recent research.

An academic tradition in which the relationship between language and power has been thoroughly examined is the large body of work focused on gender. Frequently cited by scholars of language and gender is Marjorie Harness Goodwin's *He-Said-She-Said* (1990). Although her analysis was based on audio recorded interaction and direct observation rather than visually recorded data, in many ways this study is representative of the goals and methods of microethnographic research. Early microethnography examined the ways in which school children in peer groups negotiated relations of inclusion, exclusion, and status. Goodwin studied the same processes outside of the classroom. She analyzed the politics of everyday life among African American children living in a working-class neighborhood of 1970s Philadelphia. Her sequential microanalysis of talk is grounded in the context of the children's play activities. Goodwin's in-depth look at children's interactional activities added complexity to prevailing understandings of how conflict is accomplished and social relations are managed in everyday contexts. For example, although her work is often used to support the claim that girls' peer groups are less hierarchical and competitive than boys' (e.g., Maltz & Borker, 1982; Tannen, 1990), the study presents a more nuanced picture. Although girls' play often took a more egalitarian and collaborative form, girls also showed themselves to be capable of using a competitive style and constructing asymmetrical play groups. The type of activity, as well as the participants involved, determined the choice of style. Thus, this study demonstrated the importance of analyzing gendered language use in the context of the activities in which it is embedded.

As such, Goodwin's work provided a model for other research on language and gender. Important earlier analyses of male dominance in interaction (e.g., Fishman, 1978; West & Zimmerman, 1983) have been criticized for assuming that certain linguistic or interactional forms (such as questions or interruptions) are directly indicative of power

differences rather than considering how other situational factors may affect their deployment and interpretation (e.g., Tannen, 1993). Mendoza-Denton (1995) suggests that, in addition to acknowledging other social variables (such as race, ethnicity, and class), gender researchers need to "study language behavior within contextualized, situated settings, conducting micro-level analyses alongside large-scale statistical studies" (p. 53).

An example of this approach is provided by Ochs and Taylor (1995), who examine the archetypal daily activity of middle-class families: dinnertime conversation. They describe what they call the "father knows best" dynamic—an interactional pattern through which paternal authority is produced and maintained. As much by their wives' actions as their own, fathers are made the "primary audience, judge and critic" of the narratives told by other family members (p. 99). The authors note that dinnertime stories are generally conarrated—one person introduces the story and others collaborate in its telling. Parties other than the initial storyteller can render problematic the "action, condition, thought, or feeling of a protagonist or a co-narrator" (110). Ochs and Taylor find that fathers most often do this problematizing and children are most often problematized. Mothers are as often problematized as they are the problematizers. The analysis shows how all parties in the interaction collaborate to put fathers in a position from which they can take the authoritative role of problematizer.

Two important themes emerge from this study. The first is the interrelationship of knowledge, power, and activity. Dinnertime storytelling interactions produce certain kinds of knowledge while they simultaneously produce persons who are differentially situated on a social hierarchy of knowledge (or authority).<sup>1</sup> A second theme is that these outcomes are not merely imposed by the powerful, but are jointly created by multiple participants in the interaction, often including those who have the most to lose from the power structures that emerge.

Similar patterns of domination along gender lines can be seen in public discourse that is more explicitly political. Mendoza-Denton (1995), for example, studied the interactional patterns of the congressional hearings in which Anita Hill and Clarence Thomas testified with regard to Thomas' Supreme Court appointment. She notes that many viewers perceived that Hill and Thomas were not treated equally in these hearings. Mendoza-Denton set out to identify the precise interactional means through which this asymmetry was accomplished. She found that the congressmen systematically created different kinds of interactional opportunities for Hill and Thomas. For example, Thomas was asked concise questions that contained only presuppositions with which he could be counted on to agree. Thus, Thomas was able to produce decisive yes or no answers. On the other hand, Hill received questions with embedded presuppositions that she needed to dispel before continuing with her answer; thus her responses were more elaborated and syntactically complex than those of Thomas. Another difference was in the receipt of Hill's and Thomas' answers by the congressmen. Thomas' replies, in particular, were frequently followed by lengthy gaps allowing "the weight of his responses to 'sink in'

<sup>1</sup>This is underscored in another study based on the same set of data (Ochs, Smith & Taylor, 1996), in which the authors analyze similar stories from the standpoint of Vygotskian theory, arguing that coconstructed narrative "gives structure to family roles, relationships, values, and worldviews" (p. 95).

with the audience" (p. 55). Once again, it is shown that the authority of a particular figure is cocreated—in this case by both Thomas and the congressmen questioning him.

Duranti (1994) examines the collaborative construction of status in a very different kind of political setting, a Samoan village council, or *fono*. Using a perspective that he labels "ethnopragmatic" (p. 167), Duranti demonstrates that grammatical choices have moral and political implications. In particular, he analyzes how and in what situations Samoan speakers make use of a feature of their language called ergativity, in which the subject of a transitive clause receives a special agentive marking. Duranti argues that the choice of whether to explicitly mark agency through this grammatical device is made based on *moral flow*, the "progressive and cooperative framing of characters and events in terms of their positive or negative value vis-à-vis community standards as defined in the ongoing interaction" (p. 121). Like the studies on gender mentioned previously, language is examined as embedded in particular speech genres and social events. However, Duranti goes further—his grammatical analysis is firmly grounded within ethnographic descriptions of other aspects of the *fono* as an activity, such as the way in which human beings are positioned in space and the order in which individuals participate in ceremonial drinking. All of these factors are considered in terms of their implications for the construction of status roles and the negotiation and solution of political problems.

Similarly, Keating (1998) studies the interrelationship of language, physical space, and social status in another Pacific society—the island of Pohnpei. Keating's work focuses on the ways in which speakers structure an elaborate and multitiered social hierarchy through the use of both exaltive and humiliative honorifics. These linguistic forms are analyzed as they are used in specific contexts of Pohnpeian life, such as the ceremonial preparation of *sakau* (kava) and oratorical practice. An important part of her study hinges on the way in which Pohnpeians use physical space to assign and maintain status positions—she argues that status can be more finely differentiated through the use of space than it can be through language. Like many of the studies we have described in this section, Keating demonstrates that social hierarchy is not necessarily imposed from above; rather, it is collaboratively constructed by both lower and higher status participants.

Closely related to the means by which stratification is displayed within these political contexts are the forms of stratification that have been revealed by studies of courtroom talk. The participants in the interaction analyzed by Mendoza-Denton, for example, make use of the conventions of legal discourse, along with more general features of conversation, to position Thomas as the more authoritative figure. In such legal contexts, questions of status become questions of knowledge as the credibility or truthfulness of persons is evaluated and social facts such as guilt and innocence are produced. Conversation analysts have extensively studied such legal forms of talk and revealed much about the interactional mechanisms underlying these processes; such work will not be reviewed here. However, a microethnographic approach can go beyond the sequential analysis of talk, as do Keating and Duranti, in order to also explore the more fundamental situatedness of bodies moving and positioning themselves in space.

This is shown by LeBaron and Streeck (1997) in an analysis of another kind of legal interaction, a murder interrogation, in which the interrogators use the built space of a small room to define the suspect's experience as one of confinement, thus moving him toward confession. By attending to the postural configurations of the participants, the

researchers identify two distinct stages of the interaction. In the first, a degree of a parity is sustained—the three men are positioned around a table equidistant from one another. The second stage begins when the detective moves to within inches of the suspect's body. Although the suspect does not physically move, his position is changed in relation to the other participants—he is cut off from the table and has access only to a small amount of physical space. The talk changes as well: The suspect's rights to speak are curtailed and the spatial confinement of the room is referenced for rhetorical purposes in the detective's language. ("You're locked in a room." "There's not a way out." p. 20). During this stage, the suspect confesses. This study demonstrates how much we miss if we consider only linguistic means of domination without looking systematically at the use of other resources—spatial, postural, and material.

Although several researchers we have reviewed argue that social structures are jointly produced by both high and low status participants, the previous analysis points out that such "collaboration" is by no means symmetrical (and may not even be consensual). Mehan (1990) reminds us that although all parties in an interaction participate in the construction of social worlds, when those worlds conflict their unequal status becomes evident. "All people define situations as real; but when powerful people define situations as real, then they are real for everybody involved in their consequences" (p. 160).

As in the inception of microethnography, learning environments continue to be an important focus of microanalytic research on the interactional construction of power (e.g., McDermott, 1993; Mehan, 1993). As discussed earlier, Vygotskian frameworks have become important for considerations of the social nature of cognitive processes, particularly in the context of learning. Despite the Marxist origins of these ideas, however, questions of power and dominance are not always made central to this framework. Litowitz (1997) addresses this absence by considering the role of power contests within the Vygotskian model of learning. Perhaps the most influential idea of Vygotskian learning theory is the "zone of proximal development"—the conceptual distance between what a novice can achieve unassisted and what he or she can achieve in collaboration with an expert or more experienced peer. Litowitz points out that this concept is inherently "adultocentric" (p. 477)—the behavior of the learner is defined from the perspective of what the adult or expert knows. It assumes that the overall object of the activity is the transformation of novice into expert. Rather than make this assumption, Litowitz questions what motivates adults to teach and children to learn and suggests that dynamics of identification and resistance in the learning process must be taken into account. She argues that children and novices are provoked not by an innate desire to learn but by the desire to *become* the person who is modeled for them. Failure to learn may be based on a lack of identification.

Litowitz further argues that resistance can actually be part of the learning process. To take the role of deciding what kinds of activities the pair will engage in involves the child becoming more like the adult. When children resist, they are actually taking greater responsibility for the overall activity. One of the most effective ways that children can resist is to frame their refusal to participate within the activity itself. This analysis shows how acknowledging the power contests in which learning takes place can enrich learning theory.

These observations are relevant not only to parent-child and teacher-student interaction but also to expert-novice learning situations in workplace environments. In their study of apprenticeship as "legitimate peripheral participation," Lave and Wenger (1991)

point out that “[o]ne way to think of learning is as the historical production, transformation, and change of persons” (p. 51). This transformational process may have different consequences for individuals depending on, among other things, the commodification of apprentice’s work. Apprenticeship as social structure may not always result in effective learning. They write:

Although apprenticeship has no determined balance of relations of power as an abstract concept, it does have such relations in every concrete case. Any given attempt to analyze a form of learning through legitimate peripheral participation must involve analysis of the political and social organization of that form, its historical development, and the effects of both of these on sustained possibilities for learning. (p. 64)

The process of learning a profession is thus a site at which knowledge and power interact. A common view of this socialization process is that it is one of learning a language. For example, this perspective is taken by Cohn (1987) in an ethnography of the high-level U.S. government employees responsible for formulating the nation’s nuclear defense strategies. She points out that “[l]earning the language is a transformative, rather than an additive process. When you choose to learn it you enter a new mode of thinking”—one in which previously held beliefs and questions may become simply impossible (p. 716). Charles Goodwin (1994), however, conceives of this process as learning a way of seeing. He describes the Rodney King trial as a training session in the visual practices used by police officers. Defense attorneys convinced jurors that the beating of Rodney King was justified by providing them with an alternative way of seeing the activities of the police officers and Mr. King—the way, the defense attorneys argued, that any police officer would see them. His analysis reveals that professional knowledge is constituted by discursive, cognitive, and perceptive practices.

Goodwin (and Cohn as well) examines a situation in which human reactions to violence are transformed as outsiders become privy to the ways of seeing and talking through which professionals define their experience. The dramatic subject matter of the Rodney King events highlights the fact that these socialization processes are not neutral and not necessarily benign. Certain kinds of knowledge are produced whereas others are inhibited. This knowledge does not take the form of facts about the world, but rather consists of bodily practices of perception and articulation. Studies of other skilled professions show us the ways in which hand movements, bodily postures, and manners of manipulating tools are taken on by novices in the process of becoming a professional. Such learning constitutes a fundamental reshaping of the body and its practices—the formation of habitus—making possible certain ways of being in the world and constraining others (Bourdieu, 1977).

## CONCLUSION

The studies reviewed in the previous section demonstrate that the concerns motivating the original development of microethnography have continued into the present day. Fine-grained analyses of talk and bodily action in situated cultural contexts have provided

further support for theories that emphasize the interactional constitution of power. A theme that emerges from contemporary research is the collaborative construction of social hierarchies by both high- and low-level participants. At the same time, we also are reminded of how status matters with respect to the ability to construct realities that “stick”. Traditional macrosocial categories (e.g., gender, social class, race) continue to thread through these studies, but the microethnographic approach of examining how such categories are made relevant and reproduced on a moment-to-moment basis in interaction has been taken up by a greater number of researchers across disciplines. Finally, studies of cognition as socially distributed have improved our understanding of what thinking and learning are, and this in turn has augmented our understanding of social structure in its relation to processes of knowledge formation.

In sum, what we witness today is the enactment of a truly holistic framework in the study of human activities—a framework that captures the interactional and discursive constitution of human relations and social organization, does not abstract interaction from its material foundations and historical contexts, locates individual cognition as much as socially shared symbol formation within moments of real social life, and by keeping a steady focus on the moment-by-moment emergence of the microcosms of human life, lives up to rigorous standards of empirical adequacy. What once appeared to be a narrow focus on the microlevel of human activity has linked up with an encompassing and complex understanding of what Lukacs called the “totality” of social facts (Lukacs, 1971).

## REFERENCES

- Agar, M. (1975). Cognition and events. In M. Sanchez & B. G. Blount (Eds.), *Sociocultural Dimensions of Language Use* (pp. 41–56). New York: Academic Press.
- Amann, K., & Knorr-Cetina, K. (1990). The fixation of (visual) evidence. In M. Lynch & S. Woolgar (Eds.), *Representation in Scientific Practice* (pp. 85–121). Cambridge, MA: MIT Press.
- Bar-Hillel, Y. (1954). Indexical expressions. *Mind*, 63, 3459–3479.
- Bateson, G. (1949). Bali: The value system of a steady state. In M. Fortes (Ed.), *Social structure: Studies presented to A. R. Radcliffe-Brown* (pp. 33–53). Oxford, UK: Clarendon.
- Bateson, G. (1958). *Naven* (2nd ed.). Stanford, CA: Stanford University Press. (Original work published 1936)
- Bateson, G. (1972). *A theory of play and fantasy, Steps to an ethology of mind* (pp. 177–193). New York: Ballantine. (Original work published 1956)
- Bateson, G. (1979). *Mind and nature: A necessary unity*. London: Wildwood House.
- Bateson, G., & Mead, M. (1942). *Balinese character: A Photographic Analysis*. New York: New York Academy of Sciences.
- Berger, P., & Luckmann, T. (1967). *The social construction of reality*. Garden City, NY: Doubleday.
- Birdwhistell, R. (1970). *Kinesics and context*. Philadelphia: University of Pennsylvania Press.
- Birdwhistell, R. (1972). A kinesic-linguistic exercise. In J. J. Gumperz & D. Hymes (Eds.), *Directions in Sociolinguistics* (pp. 381–404). New York: Holt, Rinehart & Winston.
- Bodrova, E., & Leong, D. J. (1996). *Tools of the mind: The Vygotskian approach to early childhood education*. Englewood Cliffs, NJ: Merrill.
- Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge, UK: Cambridge University Press.
- Bowker, G. C., & Star, S. L. (1999). *Sorting things out. Classification and its consequences*. Cambridge, MA: MIT Press.
- Bremme, D. W., & Erickson, F. (1977). Behaving and making sense. *Theory Into Practice*, 16, 153–160.

- Button, G. (Ed.). (1993). *Technology in working order: Studies of work, interaction, and technology*. London: Routledge.
- Chaiklin, S., & Lave, J. (Eds.). (1993). *Understanding practice. Perspectives on activity and context*. Cambridge, UK: Cambridge University Press.
- Cicourel, A. V. (1968). *The social organization of juvenile justice*. New York: Wiley.
- Cicourel, A. V., Jennings, K. H., Jennings, S. H. M., Leiter, K. C. W., MacKay, R., Mehan, H., & Roth, D. R. (1974). *Language use and school performance*. New York: Academic Press.
- Cohn, C. (1987). Sex and death in the rational world of defense intellectuals. *Signs: Journal of Women in Culture and Society*, 12(4), 687–718.
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- Cole, M., & Scribner, S. (1974). *Culture and thought*. New York: Wiley.
- Coulter, J., & Parsons, E. D. (1990). The praxiology of perception: Visual orientations and practical action. *Inquiry*, 33, 251–272.
- Dreyfus, H. L. (1991). *Being-in-the-World. A Commentary on Heidegger's "Being and Time."* Cambridge, MA: MIT Press.
- Duranti, A. (1994). *From grammar to politics: Linguistic anthropology in a Western Samoan village*. Berkeley and Los Angeles: University of California Press.
- Engels, F. (1960). *Herr Eugen Duhring's revolution in science (Anti-Duhring)*. New York: International Publishers.
- Engeström, Y. (1992). *Interactive expertise: Studies in distributed working intelligence* (Research Bulletin 83). Helsinki, Finland: Department of Education.
- Engeström, Y., & Middleton, D. (1996). *Cognition and communication at work*. Cambridge, UK: Cambridge University Press.
- Erickson, F. (1971). *The cycle of situational frames: A model for microethnography*. Paper presented at the Midwest Anthropology Meeting, Detroit, MN.
- Erickson, F. (1975). Gatekeeping and the melting pot. *Harvard Educational Review*, 45, 44–70.
- Erickson, F. (1995). Ethnographic microanalysis. In Nancy Horn Berger & Sandy McKay (Eds.). *Sociolinguistics & language teaching*, pp. 283–306.
- Erickson, F., & Shultz, J. (1977). When is a context? Some issues in the analysis of social competence. *The Quarterly Newsletter of the Institute for Comparative Human Development*, 1(2), 5–10.
- Erickson, F., & Shultz, J. (1982). *The counselor as gatekeeper. Social interaction in interviews*. New York: Academic Press.
- Fishman, P. (1978). Interaction: The work women do. *Social Problems*, 24, 397–406.
- Foucault, M. (1980). *Power/Knowledge: Selected interviews and other writings 1972–1977* (C. Gordon, Ed.). New York: Pantheon.
- Frake, C. (1964). How to ask for a drink in Subanun. *American Anthropologist*, 66, 127–132.
- Garfinkel, H. (1967). *Studies in ethnomethodology*. Englewood Cliffs, NJ: Prentice-Hall.
- Geertz, C. (1983). *Local knowledge*. New York: Basic Books.
- Gibson, J. J. (1962). Observations on active touch. *Psychological Review*, 69, 477–491.
- Gibson, J. J. (1986). *The ecological approach to visual perception*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Gladwin, T. (1970). *East is a big bird. Navigation and logic on Puluwat Atoll*. Cambridge, MA: Harvard University Press.
- Goffman, E. (1959). *The presentation of self in everyday life*. Garden City, NY: Doubleday.
- Goffman, E. (1961). *Encounters*. Indianapolis, IN: The Bobbs-Merrill.
- Goffman, E. (1963). *Behavior in public places*. New York: The Free Press.
- Goffman, E. (1964). The neglected situation. *American Anthropologist*, 66(6, Pt. 2), 133–136.
- Goffman, E. (1969). *Behavior in public places. Notes on the social organization of gatherings*. New York: The Free Press.
- Goffman, E. (1971). *Relations in Public. Microstudies of the Public Order*. New York: Basic Books.
- Goffman, E. (1974). *Frame analysis*. New York: Harper & Row.
- Goffman, E. (1976). *Gender advertisements*. Cambridge, MA: Harvard University Press.
- Goffman, E. (1981). *Forms of talk*. Oxford, UK: Blackwell.
- Goodman, N. (1978). *Ways of worldmaking*. Indianapolis, IN: Hackett.
- Goodwin, C. (1987). Forgetfulness as an interactive resource. *Social Psychology Quarterly*, 50(2), 115–131.
- Goodwin, C. (1993). *The blackness of black: Color categories as situated practice*. November 2–7, 1993.
- Goodwin, C. (1994). Professional vision. *American Anthropologist*, 96(3), 606–633.
- Goodwin, C. (1996). Practices of color classification. *Ninchi Kagaku*, 3(2), 62–81.
- Goodwin, C. (1997). The Blackness of Black: Color Categories as Situated Practice. In Lauren Resnick, Roger Säljö, Clotilde Pontecorvo, & Barbara Burge (Eds.). *Discourse, Tools and Reasoning: Essays on Situated Cognition* (pp. 111–140). New York: Springer-Verlag.
- Goodwin, C., & Goodwin, M. (1996). Seeing as situated activity: Formulating planes. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work* (pp. 61–95). Cambridge, UK: Cambridge University Press.
- Goodwin, M. H. (1990). *He-said-she-said: Talk and social organization among black children*. Indianapolis and Bloomington: Indiana University Press.
- Goody, E. (1989). Learning and the division of labor. In M. Coy (Ed.), *Anthropological perspectives on apprenticeship*. Albany State University of New York Press.
- Gruneberg, M. M., Morris, P. E., & Skykes, R. N. (Eds.). (1988). *Practical aspects of memory: Vol. 1. Memory in everyday life*. Chichester, UK: John Wiley.
- Gumperz, J. J. (1976). Language, communication, and public negotiation. In P. R. Sanday (Ed.), *Anthropology and the public interest*. New York: Academic Press.
- Hall, E. T. (1959). *The silent language*. Garden City, NY: Doubleday.
- Hanks, W. (1990). *Referential practice: Language and lived space among the Maya*. Chicago: University of Chicago Press.
- Hanks, W. F. (1996a). *Language and communicative practices*. Boulder, CO: Westview Press.
- Hanks, W. F. (1996b). Language form and communicative practices. In J. J. Gumperz & S. C. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 232–270). Cambridge, UK: Cambridge University Press.
- Hastrup, K. (1995). Incorporated knowledge. *MimeJournal*, 1995, 2–9.
- Haviland, J. B. (1996). Projections, transpositions, and relativity. In J. J. Gumperz & S. C. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 271–323). Cambridge, UK: Cambridge University Press.
- Heath, C. C., & Luff, P. K. (1992). Crisis and control: Collaborative work in London Underground control rooms. *Journal of Computer Supported Cooperative Work*, 1(1), 24–48.
- Heath, C., & Luff, P. (1993). Disembodied conduct: Interactional asymmetries in video-mediated communication. In G. Button (Ed.), *Technology in working order: Studies of work, interaction, and technology* (pp. 35–54). London: Routledge.
- Heath, C., & Luff, P. (1996). Convergent activity: Line control and passenger information on the London Underground. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work* (pp. 96–129). Cambridge, UK: Cambridge University Press.
- Heidegger, M. (1962). *Being and time*. New York: Harper & Row. (Original work published 1926)
- Heidegger, M. (1967). *What is a thing?* South Bend, IN: Gateway.
- Henderson, K. (1999). *On line and on paper: Visual representations, visual culture, and computer graphics in design engineering*. Cambridge, MA: MIT Press.
- Hutchins, E. (1991). The social organization of distributed cognition. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 283–307). Washington, DC: American Psychological Association.
- Hutchins, E. (1995). *Cognition in the wild*. Cambridge, MA: MIT Press.
- Hutchins, E., & Klausen, T. (1996). Distributed cognition in an airline cockpit. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work* (pp. 15–34). Cambridge, UK: Cambridge University Press.
- Huxley, J. (Ed.). (1966). Ritualization of behaviour in animals and man. *Proceedings of the Royal Society of London: Vol. 251*. London: Royal Society.
- Jackson, P. W. (1968). *Life in classrooms*. New York: Holt, Rinehart & Winston.
- Keating, E. (1998). *Power sharing: Language, rank, gender and social space in Pohnpei, Micronesia*. New York: Oxford University Press.
- Keller, C., & Keller, J. D. (1993). Thinking and acting with iron. In S. Chaiklin & J. Lave (Eds.), *Understanding practice* (pp. 125–143). Cambridge, UK: Cambridge University Press.
- Keller, C. M., & Keller, J. D. (1996a). *Cognition and tool use. The blacksmith at work*. Cambridge, UK: Cambridge University Press.

- Keller, C. M., & Keller, J. D. (1996b). Imaging in iron, or thought is not inner speech. In J. J. Gumperz & S. Levinson (Eds.), *Rethinking linguistic relativity* (pp. 115–131). Cambridge, UK: Cambridge University Press.
- Kendon, A. (1977). *Studies in the behavior of social interaction*. Lisse, NL: Peter de Ridder Press.
- Kendon, A. (1990). Conducting interaction: Patterns of behavior in focused encounters. New York: Cambridge University Press.
- Kirsh, D. (1995a). Complementary strategies: Why we use our hands when we think. *Proceedings of the 17th Annual conference of the Cognitive Science Society* (Pittsburgh, PA, August 1995), Hillsdale, NJ: Lawrence Erlbaum Associates.
- Kirsh, D. (1995b). The intelligent use of space. *Artificial Intelligence*, 73, 31–68.
- Knorr-Cetina, K. (1981). *The manufacture of knowledge*. Oxford, UK: Pergamon Press.
- Knorr-Cetina, K. D., & Mulkay, M. (Eds.). (1983). *Science observed*. London: Sage.
- Latour, B. (1986). Visualization and cognition: Thinking with eyes and hands. *Knowledge and society: Studies in the sociology of culture past and present*, 6, 1–40.
- Latour, B. (1990). Drawing things together. In M. Lynch & S. Woolgar (Eds.), *Representation in scientific practice* (pp. 19–67). Cambridge, MA: MIT Press.
- Latour, B., & Woolgar, S. (1986). *Laboratory life: The social construction of scientific facts*. Princeton, NJ: Princeton University Press.
- Lave, J. (1988). *Cognition in practice*. Cambridge, UK: Cambridge University Press.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participations*. Cambridge, UK: Cambridge University Press.
- Lave, J., Murtaugh, M., & de la Rocha, O. (1984). The dialectic of arithmetic in grocery shopping. In B. Rogoff & J. Lave (Eds.), *Everyday cognition. Its development in social context* (pp. 67–94). Cambridge, MA: Harvard University Press.
- LeBaron, C., & Streeck, J. (1997). Built space and the interactional framing of experience during a murder interrogation. *Human Studies*, 20, 1–25.
- LeBaron, C., & Streeck, J. (2000). Gestures, knowledge, and the world. In D. McNeill (Ed.), *Language and gesture*. Cambridge, UK: Cambridge University Press.
- Levinson, S. C. (1992). *Relativity in spatial conception and description*.
- Levinson, S. C. (1996). Language and space. *Annual Review of Anthropology*, 25, 353–382.
- Litowitz, B. (1997). Just say no: Responsibility and resistance. In M. Cole, Y. Engeström, & O. Vasquez (Eds.), *Mind, culture and activity: Seminal papers from the laboratory of comparative human cognition* (pp. 473–484). Cambridge, UK: Cambridge University Press.
- Lukacs, G. (1971). *History and class consciousness; studies in Marxist dialectics*. Cambridge, MA: MIT Press.
- Luria, A. R. (1976). *Cognitive development, its cultural and social foundations*. Cambridge, UK: Cambridge University Press.
- Luria, A. R. (1979). *The making of mind : A personal account of Soviet psychology* (M. Cole & S. Cole, Eds.). Cambridge, MA: Harvard University Press.
- Lynch, M. (1985a). *Art and artifact in laboratory science: A study of shop work and shop talk in a research laboratory*. London: Routledge and Kegan Paul.
- Lynch, M. (1985b). Discipline and the material form of images: An analysis of scientific visibility. *Social Studies of Science*, 15, 37–66.
- Lynch, M. (1993). *Scientific practice and ordinary action*. Cambridge, UK: Cambridge University Press.
- Lynch, M., Potter, J., & Garfinkel, H. (1983). Temporal order in laboratory work. In K. D. Knorr-Cetina & M. Mulkay (Eds.), *Science observed* (pp. 205–238). London: Sage.
- Maltz, D. N., & Borker, R. (1982). A cultural approach to male-female miscommunication. In J. J. Gumperz (Ed.), *Language and social identity* (pp. 196–216). Cambridge, UK: Cambridge University Press.
- Marx, K., & Engels, F. (1960). *The German ideology, Pt. I & III*. New York: International Publishers. (Original work published 1846)
- McDermott, R. (1993). The acquisition of a child by a learning disability. In S. Chaiklin and J. Lave (Eds.) *Understanding practice: Perspectives on activity and context* (pp. 269–305). New York: Cambridge University Press.
- McDermott, R., Gospodinoff, K., & Aron, J. (1978). Criteria for an ethnographical adequate description of concerted activities and their contexts. *Semiotica*, 24(3/4), 245–276.
- McDermott, R. P., & Gospodinoff, K. (1979). Social contexts for ethnic borders and school failure. In A. Wolfgang (Ed.), *Nonverbal behavior* (pp. 175–195). New York: Academic Press.
- McDermott, R. P., & Roth, D. (1978). Social organization of behavior: Interactional approaches. *Annual Review of Anthropology*, 7, 321–345.
- McQuown, N. (1956). *The natural history of an interview* (Vol. 15). Chicago: Chicago manuscripts in cultural anthropology. University of Chicago.
- Mehan, H. (1978). Structuring school structure. *Harvard Educational Review*, 48(1), 32–64.
- Mehan, H. (1979). *Learning lessons: Social organization in the classroom*. Cambridge, MA: Harvard University Press.
- Mehan, H. (1984). Institutional decision making. In B. Rogoff & J. Lave (Eds.), *Everyday cognition. Its development in social context* (pp. 41–66). Cambridge, MA: Harvard University Press.
- Mehan, H. (1985). The structure of classroom discourse. In T. van Dijk (Ed.), *Handbook of discourse analysis* (Vol. 3, pp. 119–131). London: Academic Press.
- Mehan, H. (1990). Oracular reasoning in a psychiatric exam: The resolution of conflict in language. In A. Grimshaw (Ed.), *Conflict talk: Sociolinguistic investigations of arguments in conversation*. Cambridge, UK: Cambridge University Press.
- Mehan, H. (1991). The school's work on sorting students. In D. Boden & D. H. Zimmerman (Eds.), *Talk and social structure* (pp. 71–90). Berkeley and Los Angeles: University of California Press.
- Mehan, H. (1993). Beneath the skin and between the ears: A case study in the politics of representation. In S. Chaiklin and J. Lave (Eds.) *Understanding practice: Perspectives on activity and context* (pp. 241–268). New York: Cambridge University Press.
- Mehan, H., & Wood, H. (1975). *The reality of ethnomethodology*. New York: Wiley.
- Mendoza-Denton, N. (1995). Pregnant pauses: Silence and authority in the Anita Hill–Clarence Thomas hearings. In K. Hall and M. Bucholtz (Eds.), *Gender articulated: Language and the socially constructed self* (pp. 51–66). New York: Routledge.
- Merleau-Ponty, M. (1962). *Phenomenology of perception*. London: Routledge.
- Middleton, D. (forthcoming). *Social remembering*. London: Sage.
- Nardi, B. (1996). *Context and consciousness: Activity theory and human-computer interaction*. Cambridge, MA: MIT Press.
- Nardi, B. A. (1999). *Information ecologies: Using technology with heart*. Cambridge, MA: MIT Press.
- Norman, D. (1993a). *Things that make us smart*. Reading, MA: Addison-Wesley.
- Norman, D. A. (1993b). Cognition in the head and in the world: An introduction to the special issue on situated action. *Cognitive Science*, 17, 1–6.
- Ochs, E., Gonzales, P., & Jacoby, S. (1996). "When I come down I'm in the domain state": Grammar and graphic representation in the interpretive activity of physicists. In E. Ochs, E. A. Schegloff, & S. Thompson (Eds.), *Interaction and grammar*. Cambridge, UK: Cambridge University Press.
- Ochs, E., Smith, R., & Taylor, C. (1996). Detective stories at dinnertime: Problem solving through co-narration. In C. Briggs (Ed.), *Disorderly discourse: Narrative, conflict and inequality*. New York: Oxford University Press.
- Ochs, E., & Taylor, C. (1995). The "father knows best" dynamic in dinnertime narratives. In K. Hall and M. Bucholtz (Eds.) *Gender articulated: Language and the socially constructed self* (pp. 97–120). New York: Routledge.
- Philips, S. U. (1974). Warm Springs 'Indian time': How the regulation of participation affects the progression of events. In R. Bauman & J. Sherzer (Eds.), *Exploration in the ethnography of speaking* (pp. 92–109). Cambridge, UK: Cambridge University Press.
- Pike, K. (1966). Etic and emic standpoints for the description of behavior. In A. Smith (Ed.), *Communication and culture* (pp. 152–163). New York: Holt, Rinehart & Winston.
- Polanyi, M. (1958). *Personal knowledge. Towards a post-critical philosophy*. New York: Harper Torchbooks.
- Quine, W. V. O. (1953). *From a logical point of view*. Cambridge, MA: Harvard University Press.
- Resnick, L. B., Levine, J. M., & Teasley, S. D. (1991). *Perspectives on socially shared cognition*. Washington, DC: American Psychological Association.
- Rogoff, B. (1984). Introduction. In B. Rogoff & J. Lave (Eds.), *Everyday cognition. Its development in social context* (pp. 1–8). Cambridge, MA: Harvard University Press.

- Rogoff, B. (1991). Social interaction as apprenticeship in thinking: Guided participation in spatial planning. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 349–364). Washington, DC: American Psychological Association.
- Roth, P., & Barrett, R. (1990). Deconstructing quarks. *Social Studies of Science*, 20, 579–632.
- Ryle, G. (1949). *The concept of mind*. London: Mayflower Press.
- Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language*, 50, 696–735.
- Scheflen, A. (1973). *Communicational structure*. Bloomington: Indiana University Press.
- Scheflen, A. (1974). *How behavior means*. Garden City, NY: Anchor Press.
- Scheflen, A. E. (1963). Communication and regulation in psychotherapy. *Psychiatry*, 26, 126–136.
- Schutz, A. (1982). *Collected Papers: Vol. I*. Amsterdam: Martinus Nijhoff.
- Scribner, S. (1984). Studying working intelligence. In B. Rogoff & J. Lave (Eds.), *Everyday cognition. Its development in social context* (pp. 9–40). Cambridge, MA: Harvard University Press.
- Smith, L. M., & Geoffrey, W. (1968). *The complexities of an urban classroom; an analysis toward a general theory of teaching*. New York: Holt, Rinehart & Winston.
- Streeck, J. (1983). *Social order in child communication. A study in microethnography*. Amsterdam: Benjamins.
- Streeck, J. (1984). Embodied contexts, transcontextuals, and the timing of speech acts. *Journal of Pragmatics*, 8(1), 113–137.
- Streeck, J. (1996). How to do things with things: Objets trouvés and symbolization. *Human Studies*, 19, 365–384.
- Streeck, J., & Kallmeyer, W. (2001). Interaction by inscription. *Journal of Pragmatics*, 33, 465–490.
- Suchman, L. (1987). *Plans and situated action*. Cambridge, UK: Cambridge University Press.
- Suchman, L. (1993). Artificial intelligence as craftwork. In S. Chaiklin & J. Lave (Eds.), *Understanding practice* (pp. 144–178). Cambridge, UK: Cambridge University Press.
- Suchman, L. (1996). Constituting shared workspaces. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work* (pp. 35–60). Cambridge, UK: Cambridge University Press.
- Tannen, D. (1990). *You just don't understand: Women and men in conversation*. New York: Ballantine.
- Tannen, D. (1993). The relativity of linguistic strategies: Rethinking power and solidarity in gender and dominance. In D. Tannen, (Ed.) *Gender and conversational interaction* (pp. 165–188). New York: Oxford University Press.
- Taylor, J. R., & Van Every, E. J. (2000). *The Emergent organization. Communication as its site and surface*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind. Cognitive science and human experience*. Cambridge, MA: MIT Press.
- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Weick, K. (1995). Creativity and the aesthetics of imperfection. In C. Ford & D. A. Goia (Eds.), *Creative action in organizations*. Thousand Oaks, CA: Sage.
- Weick, K. (1998). Improvisation as a mindset for organizational analysis. *Organization Science*, 9, 543–555.
- Weick, K., & Roberts, K. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly*, 38, 357–381.
- Wertsch, J. V. (1981). *Voices of the mind. A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.
- Wertsch, J. V. (1991). A sociocultural approach to socially shared cognition. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 85–100). Washington, DC: American Psychological Association.
- West, C., & Zimmerman, D. (1983). Small insults: A study of interruptions in cross-sex conversations between unacquainted persons. In B. Thorne, C. Kramerae, & N. Henley (Eds.), *Language, gender and society* (pp. 103–117). Rowley, MA: Newbury House.
- Winograd, T., & Flores, F. (1986). *Understanding computers and cognition*. Norwood, NJ: Ablex.
- Wolcott, H. F. (1973). *The man in the principal's office; an ethnography*. New York: Holt, Rinehart & Winston.
- Woolgar, S. (1988). *Science: The very idea*. London: Tavistock.

## VI

## Extensions of Technology