

CONVERSATION ANALYSIS FOR EDUCATIONAL
TECHNOLOGISTS: THEORETICAL AND
METHODOLOGICAL ISSUES FOR RESEARCHING
THE STRUCTURES, PROCESSES, AND MEANING
OF ON-LINE TALK

Joan M. Mazur
University of Kentucky

40.1 INTRODUCTION

Research in education technology encompasses a wide range of quantitative and qualitative methods (Savenye & Robinson 1996). Methods and approaches formerly applied in the broader realm of qualitative educational research have become important to researchers in educational technology. Conversation analysis (CA) is one such qualitative approach that has recently become highly relevant for examining educational phenomena related to discourse supported by the plethora of tools and resources for computer-mediated communication. In this chapter, which focuses on CA situated within the tradition of discourse analysis, I make several assumptions. I assume that the reader is acquainted with qualitative inquiry and such terms as grounded theory, intersubjectivity, participant and nonparticipant observation, sampling, and recursion in the analytic phases of inquiry are familiar.

Concurrent with the remarkable growth of networked, interactive communication technologies during the last decade, educational technologists are beginning to see the need to scrutinize people's on-line conversations as evidence of educational

processes and outcomes. As ever-increasing numbers of people use on-line chats, listservs, threaded discussions, and video and audio conferencing for educational purposes, questions about these on-line conversations arise:

- What are characteristics of on-line conversations, and how does virtual talk-in-interaction relate to instruction, learning, and communication?
- What relationships exist between conversation and cognition or the social, distributed construction of knowledge?
- To what extent does the type of technology limit or support the discourse required for various modes of instruction?
- What are these discourses of on-line instruction?
- How can structures and processes inherent in conversation assist in the development of instructional contexts that support interactions that result in meaningful learning?
- To what extent can we take the robust body of previous research on classroom talk, which has yielded valuable information on instruction and learning, and apply it to investigations of on-line conversation?

- What are the social or ideological dimensions of on-line conversations and how do they affect learning and instruction. Are roles changing? How and why? Who has (and who does not have) access to the virtual “floor?”

What participants in on-line conferencing say—talk—is the evidence used to examine these questions related to conversation. CA techniques are not new, but the application and modification of CA to computer-mediated systems and on-line social networks by educational technologists are relatively unexplored.

There are three goals of this chapter. The first is to articulate the theoretical and methodological issues related to CA, the basic foundational principles and concepts related to a CA, and the kinds of questions that can be addressed using this approach. The second is to provide the educational technologist with practical guidelines and specific examples for conducting a CA. The third goal is to provide a research synthesis reviewing the literature related to CA focused on computer-mediated “virtual” and “actual” conversations and to discuss directions for further research on the structure, processes, and meaning of on-line talk.

40.2 OBJECTIVES

The objectives of this chapter are detailed below. After reading this chapter education technology researchers will be able to:

1. define the term *conversation analysis* and situate the method within the larger contexts of discourse analysis and ethnomethodology from which it is drawn;
2. demonstrate awareness of previous research investigating talk in educational, work, and other social settings;
3. describe the underlying epistemological, theoretical, and methodological assumptions for CA associated with two prevalent approaches: the process-product and the socio-cultural traditions (paradigms);
4. define salient aspects of investigating talk and interaction and how they relate to understanding aspects of learning, cognition, instruction, and design in on-line social computing environments;
5. describe the currently available technologies that support on-line conversation;
6. discuss the methods and mechanics of conducting CA and select among them to address research questions related to interaction appropriately;
7. understand the various computer tools (hardware and software) that are available to collect, prepare, and analyze on-line conversational data;
8. conduct a conversation analysis to examine content, interaction patterns, social networking, or other dimensions of social interaction, evidenced by talk in on-line contexts; and
9. discuss areas for future research for CA of on-line talk.

40.3 SITUATING CA IN TRADITIONS OF DISCOURSE ANALYSIS

The focus of this chapter is CA. CA is embedded in the broader field of discourse analysis. In this section an overview of this broader field of discourse analysis is presented and CA is situated within that framework. Two criteria for defining conversation are discussed and two kinds of CA are articulated.

The ubiquity of words in human communication can easily lead one to take its significance and complexities for granted. In fact, the use of language is so common that the study of its structures and processes as they relate to education and communication was minimal until the 1960s, when researchers in many fields began to see its importance. There were efforts to explore theory and methods to understand its structural, cultural, and cognitive dimensions. That is the starting point for this chapter: What is discourse, and how is it studied?

Discourse in its most everyday sense is comprised of *forms of language use*, usually spoken language or ways of speaking, whether public or private speech (van Dijk, 1997, p. 2). Another common use of the term discourse refers not only to the language used but to the ideas and philosophies extended through their use. Thus we speak of a neoconservative discourse and mean both the words and the political or social rhetoric inherent in using language to disseminate the ideas. A discourse analysis moves beyond this ordinary sense of language use and includes additional elements of interest—who uses the language, how, why, and when.

The study of discourse is considered multidisciplinary drawing from the diverse fields of linguistics, social psychology, communication, educational psychology and education, sociology of communication, and, more recently, human-computer interaction (van Dijk, 1997). Discourse studies focus on theory and analysis of text and talk in virtually all disciplines. Discourse analysis includes a broad range of areas and topics including linguistic forms and functions, style and rhetoric, psychological studies, and sociocultural research. The data for discourse analyses are drawn from informal and formal dialogue in both individual and institutional contexts documented in language, in its many forms, from spoken talk to written texts. Analyses of these types of data can be conducted at many levels: abstract analyses of linguistic function and structures of discourse, the organization of talk by language users, structures of coconstructed dialogic meaning, breakdowns in communicative patterns, and examinations of the multilayered cultural and social implications of discourse.

Language use, the communication of beliefs (cognition), and interaction are three main dimensions of discourse. Language is not simply *used*: It is used *for something*; it is functional. Primarily, language functions as a *communicative event* (Coulthard, 1993). Regardless of function, when people use language they are, in fact, doing something—they are interacting (verbally interacting). Within each of these dimensions there are levels of analyses. For instance, a focus on language use would include more obvious observable levels of the utterance or expression and move into more complex, even covert aspects such as form, meaning, and action (Joshi, Webber, & Sag, 1981). Discourse

analyses tend to focus on several topics: discourse as verbal structure, discourse as cognition, discourse and society, and discourse as action and interaction. Descriptions of these topics are outlined in the sections that follow.

40.3.1 Discourse as Verbal Structure

Words, gestures, sounds, and body language are the observable aspects or expression of discourse. Expression is symbiotic with language use, and attention to the phonological (sound) or haptic (gesture) features of spoken language, for example, can be key to understanding the structure of the discourse. Intonation may denote a question, signal a change of speaker, or close a segment of dialogue. Written discourse is multimodal and an analysis of a written text provides opportunities to examine a range of communications and representations within one text, what Kress, Leite-Garcia, and van Leeuwen (1997) term the *semiotic landscape*. The language of chat rooms, threaded discussions, and instant messaging on the Internet contains a new hybrid language of “written speech” with its own evolving semiotics (emoticons, for example) and verbal structure. Nonverbal activity such as gestures, body position, laughter, and the like occur with talk and must be analyzed as part of the communicative event.

The primary modes of discourse are talk and text. Spoken discourses such as conversations, debates, meetings, and lawyer-client, teacher-student, designer-client interactions are among the kinds of discourse to be studied. Texts, such as newspaper articles, fiction, poetry, textbooks, and advertising are written modes of discourse. van Dijk (1997), extending the work of Sinclair, Hoey, and Fox (1993) and Coulthard (1985), has noted that the analysis of the verbal structure of discourse routinely includes attention to order and form, meaning, style, rhetoric, and schema.

40.3.1.1 Order and Form. The order and form of discourse are examined through the decomposition of word order, phrases or clauses, or other aspects related to syntax. Discourse analysts explore form beyond the boundary of the sentence, the traditional unit of linguists, to determine the influences of surrounding texts or talk. Thus in discourse analysis the “completeness” of a grammatical utterance is relative. For example, a single noun may be incomprehensible grammatically but, in relation to a previous or following sentence, may be a significant part of an exchange. Word order in sentences in any language is of course not arbitrary and required for comprehension (for example, the noun-verb structure of most English sentences). But word order can also signal emphasis or contrast. Syntactical study of discourse in the type of strict linguistic sense described above is increasingly being integrated with other levels and dimensions of discourse such as how the information contained in previous sentences affects the discourse (Cumming and Ono, 1997). This brings us to another aspect of the analysis of verbal structure of discourse—meaning.

40.3.1.2 Meaning. Semantics is the study of meaning. Semantic representations in discourse in a linguistic sense usually

refer to the abstract or conceptual meaning of words. Psychologists and sociologists, however, are more pragmatic in their approach. The participants ascribe meaning to a discourse. It is the language user who understands the meaning in terms of his or her prior knowledge, understanding, and experience. A proposition is the term for the meaning of a clause or sentence. Understanding the meaning of clauses or sentences is subject to a discursive relativity principle described by van Dijk (1997, p. 9). According to this principle, any proposition is influenced by what comes before or after it in the discourse. Another key semantic concept is that of coherence (Tannen, 1986). The notion of coherence, like so many terms in discourse (and, as the reader will note later, in CA as well) has both a common-sense meaning and a more technical, theoretical one. On its face, coherence is obvious—the connectedness of the discourse. A text or conversation that loses focus and seems to have many topics or tangents lacks coherence. From a more technical perspective coherence is achieved through several linguistic devices and coherence conditions must be met. Although a full explication of these kinds of linguistic devices and conditions is beyond the scope of this review, I include the example of prosody (Gumperz, Kaltman, & O’Connor, 1984) as an exemplum. Prosody includes intonation, stress, tone, and other paralinguistic signals and speakers’ mutual understandings of these signals establish coherence conditions. Thus, a semantic analysis can include topics, themes, how focus is achieved/maintained/eroded, or discourse referents (who or what the talk is about). Semantic chunks such as headlines in a newspaper often signal boundaries for the discourse (between news stories, for example). At the global or macro level of discourse semantics the analyst will emphasize discernment of topics or themes over the linguistics and grammar that one might expect to encounter at a microlevel of syntactical or grammatical semantic analysis.

40.3.1.3 Style. Style is the component of the verbal structure of a discourse related to variation and most often evinced in word choice. Are students in conversation between teachers referred to as “members,” “collaborators,” or “participants”? Such distinctions are usually a product of the context (who is speaking, their role, the medium, etc.). As van Dijk (1997, p. 12) notes “a stylistic analysis may also define a collection of typical discursive characteristics of a genre (story vs. report), a speaker (calm vs. emotional), a group (women vs. men), a social situation (formal vs. informal) or even a whole culture (Anglo vs. Latino).”

40.3.1.4 Rhetoric. The rhetoric of a discourse is evinced in the use of figures of speech within the talk or text. Persuasive-type speech structures such as metaphor, irony, or hyperbole are among the types of rhetorical devices. Again, invoking the discourse relativity principle (van Dijk, 1997, p. 20) the function of such rhetorical structures are often dependent on coherence or meaning.

40.3.2 Cognition as Discourse

Talk and text as expression of language use are also expressions of the knowledge of the speaker or writer. Knowledge

as represented in mind is both a mental and a cultural phenomenon. Psychological dimensions of knowledge and skills are processes and representations stored in memory and play out in talk about thoughts and beliefs. Cultural and social dimensions of knowledge play out as shared meanings, judgments, and understandings of those expressed thoughts and beliefs. Amann and Knorr-Cetina (1989) note that it is plausible to “assume that [humans] will evolve cultural ‘vehicles of thinking’ other than thought that routinely supplement and replace their central [mental] operations” (p. 6). They referred to spoken discourse as one such “machinery” and that “when embedded in talk, thinking is *interactively accomplished* [their emphasis] . . . what we get instead of mentally-induced problem solutions are conversationally-induced utterances which . . . trigger certain non-obvious interpretations or performance recommendations” (p. 6). Thus, investigations of discourse also yield insight into the structure and process of cognition. The early cognitive theories of discourse were based in other fields such as text linguistics (Halliday and Hasan, 1976; van Dijk, 1972;), artificial intelligence (Shank and Abelson, 1977), and pragmatics (Grice, 1975; Searles, 1969). Early work in the cognitive context of discourse analysis focused on determining the extent to which the structure and function of texts could account for experimental psychological findings. As the theory base and methods evolved, discourse analysis shifted to investigation of text comprehension and production and away from studies of spoken conversation (Grasser, Gernsbacher, & Goldman, 1997).

40.3.2.1 Symbolic and Connectionist Models of Discourse. Cognitive models of discourse have been highly influenced by two cognitive theories: symbolic and connectionist theories. Using symbolic theories, psychologists generated descriptions of discourse production rules in the form of “IF, THEN” forms—when the condition exists the production “fires” and results in an action. Production rules can encompass physical and mental actions: IF [a beeper goes off and a person has a cell phone in her pocket], THEN [the person searches for her cell phone and runs out of a classroom] or IF [a letter sequence P-I-Z-Z-A is perceived], THEN [activate the concept of “pizza” in working memory]. Using connectionist theories, psychologists generated descriptions of discourse as representations and processes distributed among distinct units. This neural net metaphor is used to describe patterns of activation. For example, determining the meaning of a representation at a point of comprehension requires activation values for all the units and thus is distributed throughout the network. The two most influential cognitive models of discourse are Kintch’s (1988) construction-integration (CI) model and the collaborative activation-based production system (CAPS) model (Just & Carpenter, 1992). The CI model simulates dynamic changes in the activation values for units in a network. The values change as comprehension proceeds, words build on words, sentences on sentences, and so forth. In the construction phase a person creates units associated with particular text and external knowledge. In the integration phase stable patterns of activation values are established and maintained in working memory. Working memory is a factor in the CI model because capacity is

fixed, though information not in working memory continues to be resourced in long-term memory. The CAPS model uses the symbolic-connectionist foundations but brings in semantic representation and deals with capacity limits in working memory differently than the CI model. Partial pattern recognition can occur as portions of words (PIZZ, to use the previous letter sequence example) that activate the networked units without having to put all in working memory, thus freeing up space for other textual components. A combined CI/CAPS model was developed by Goldman and Varma (1995). Their model replaced the fixed buffer memory of the CI model with the CAPS method of allocating activation in working memory. The Goldman-Varma model also integrated the goals and strategies of the reader into the comprehension mechanism. Cognitive discourse analysis focused on detecting structure-building frameworks and how language structures reflect mental comprehension processes, how information is mapped in text comprehension and production, and how inference is constructed through text and situation models that include the people, setting, states, events, and actions of the mental microworld of the text description.

40.3.3 Discourse and Society

Social context is a crucial element of discourse analysis regardless of whether the focus of the analysis is verbal structure or cognition. Context is the sum of the dimensions and properties of the social situation that relate to the evolution, production or reception of discourse. Context and discourse are mutually constitutive. Discourse is affected by context, and in turn discourse can shape or modify context. Cazden (1986) noted two definitions of context as they apply to discourse analysis from the perspective of the speaker. “There are two types of context. The one the speaker brings to the situation and the one that evolves in the course of a conversation” (p. 436). van Dijk (1997) has articulated several contextual elements to consider in discourse analysis: gender, ethnicity, culture, social discourse analysis, and critical discourse analysis.

40.3.3.1 Gender, Ethnicity, and Discourse Analysis. The work of Tannen (cf. 1996, 2001) provides many excellent examples of how gender affects discourse. In fact, Tannen argues that the influences of the sociocultural constructions of gender are so strong as to render the discourse of one gender virtually incomprehensible to the other. Whether you agree with her theses on this matter, Tannen has used discourse analysis to examine how talk affects relationship, both personal and social. The communicative disparities in gender can be extended to issues of ethnicity. Inter- and intracultural discourses evolve as speech patterns develop among and within ethnic groups. Historically, talk has been a rich source of understanding how discourse is a source of social reproduction through prejudiced talk about ethnic or racial minorities and other types of hate speech.

40.3.3.2 The Explanatory Elements of Cultural Context: The Critical Turn. Discourse occurs in a cultural context,

encompassed by social institutions, roles, and practices. Misunderstandings occur as participants misread or mishear the semantics and pragmatics of discourse with which they are unfamiliar. Rules for politeness, topic changes, and giving commands change across cultures. Acceptance of difference or intolerance and even exclusion and oppression of less powerful voices can be examined through analysis of discourse. The move to situating the discourse in a larger sociocultural context adds a key element to discourse analysis. Insight into the culture through an examination of talk becomes the point of discourse analysis. Analyses at the microlevels of internal language structures, cognitive function or pragmatic purpose, and meaning have limited explanatory power. To understand how talk and text function as mirrors of mind and action, the analysis must be contextualized within the larger cultural milieu. Critical discourse analysis involves explicit articulation of the political or social posture of discourse analyst as he or she engages in the process of understanding talk or text. If the goal of the analysis is change, in addition to science or scholarship, it is critical. The critical discourse analyst argues for a moral-social dimension in research and works to make public findings regarding how discourse can oppress, silence, dominate, or prejudice.

40.3.4 Discourse as Action and Interaction: Speech Act Theory and Conversation Analysis

Discourse analysis necessarily includes the notion of discourse as interaction and action. The concept of language as action—the move from linguistic form to linguistic action—was first defined by John Austin (1962), a philosopher of language who articulated speech act theory. The central tenet of speech act theory is that speech is action. Talk implies motivation and thus talk both IS and RESULTS in action. Prior to Austin's assertions, speech was virtually unconsidered as part of communication because it was considered a passive and "fixed" phenomenon that was analyzed as "texts" and "discourses" [in the static not the dynamic sense that has come to be a more common parlance today]. Speech act theory defines specific *speech acts* as its basic units of analysis. For example, *locutionary acts* are those that produce utterances in some language. *Semantic or prepositional acts* are used to convey meaning in language use. When people *use* language, they are *doing* something—they are acting through words. Utterances are produced, these utterances have meaning, and utterances have a sociocultural dimension. Pragmatics is the field of study focused on the study of language use as action in social context. Speech acts do not occur as individual utterance in isolation. People talk to each other, they write texts for readers, they interact. Interaction takes many forms: turn-taking in conversation, agreeing and disagreeing, questioning and answering, opening and closing conversation, preparing to engage in and enter conversation, developing persona in conversation, saving face, attacking or defending, and persuading or explaining. These interactions in their social context are the subject of conversation analysis, a subset of discourse studies of interaction.

40.3.5 Definitions of Conversation and Conversation Analysis

Conversation—people talking with each other—is one of the most commonplace of all human activities. Despite its prevalence in human interaction, the study of conversation as a serious disciplinary endeavor only began in the 1960s based on the concepts and principles of speech act theory. Prior to that time, the discourse on conversation was primarily written texts that described how one should speak rather than how they actually *did* speak. Conversation occurs when any people talk with each other and can be used to indicate any activity of interactive talk, regardless of its purpose (ten Have, 1999, p. 4). The term *conversation analysis* can be construed in a broad sense to mean any study of people talking together in oral communication or language use. However, as a subdiscipline of discourse analysis, CA refers to a tradition of analysis founded by Harvey Sacks and his colleagues, including Emanuel Schegloff and Gail Jefferson. It is in this particular tradition that the term conversation analysis is used throughout most of this chapter. However, in concluding this chapter, I offer a discussion of the necessity to broaden this stricter sense of CA through theory building and new methodologies based on how conversation and interaction continue to be redefined and reshaped by computer-mediated communication technologies. Such revisions will enable researchers interested in the ever-proliferating worlds of on-line conversation to translate the traditions of CA to investigations of computer-mediated conversations.

40.4 ELEMENTS OF TALK-IN-INTERACTION

In this section, key elements of talk-in-interaction, the phenomena of interest for CA, are presented. The central purpose of CA is to investigate the norms and conventions that speakers use *in interaction* to establish communicative understandings. Traditional CA was concerned only with the speech of the conversants as an observable, external event. The seminal CA work by Sacks, Schegloff, and Jefferson (1974) articulated three basic facts about conversation: (a) turn-taking occurs, (b) one speaker tends to speak at a time, and (c) turns are taken with as little overlap between them as possible (the speakers coordinate their interactions as much as possible to avoid overlap). These basic tenets presume a continuity of time and space in face-to-face conversations and is called into question later in the examination of virtual conversations. However, for purposes of describing foundational elements of CA, they will stand, as will the presumption of shared time and space. Although the following descriptions are highly detailed, it is important to remember that the conversation analyst is not working from an abstract prescriptive definition of what constitutes a turn construction, for example, in the manner in which a linguist may define a sentence. Rather, what the turn construction consists of in an situated segment of conversation is a concern for the speakers themselves. This tension between the technical methods of analyzing conversation and its socially constituted nature is a

continual challenge to researchers working with CA to maintain perspective on this problematic.

40.4.1 Turn-Taking

The principle of turn-taking has been established as one of the central interests of CA, as it is the basic component of all conversation. The *turn form*, the *turn content*, and the *turn length* are all of interest when examining turn-taking in conversation. Turn form, turn content, and turn length are affected by the formality or informality of a situation. Turns between teachers and students, clients and lawyers, have more boundaries defined by the formal context, whereas telephone conversations among friends are freely variable and determined by elements within the interaction. Turns have two components: a turn-construction component and a turn distribution component.

Turn constructions have turn construction units that often correspond to linguistic elements such as sentences, phrases, or single words (e.g., “Yo!” or “What?”). Turn construction units have two prominent properties. One is called *projectability*. It is possible for a speaker to project, as the turn construction unit proceeds, what kind of a unit it is and when it is likely to end. This leads to the second property, *transition-relevant places*. These occur at the boundaries of the turn construction unit and make it possible for transition between speakers. These two properties are shown in the following transcript excerpt.

1. *Art*: Why don't you drop by and we'll work on the assign[ment]
2. *Ann*: [that would
3. really help me understand
4. *Art*: I'm happy to help

Ann recognizes Art's utterance “Why don't you drop by and we'll work on the assignment?” as a form of invitation and responds with an acceptance prior to Art's finishing the statement. Ann's projection on the transition-relevance place is correct, as it turns out. This is shown by Art's response. Ann projects the end of the turn construction unit *and* shows her understanding of what kind of unit that invitation represents.

However, if Ann's projection about the transition-relevance place was incorrect, the exchange might have been very different. If Art was going to say “. . . work on the assignment next Tuesday,” making the invitation much more specific, Ann's response may have been very different. Such a situation would exemplify the second component of turn-taking, turn distribution.

40.4.1.1 Turn-Taking Rules. Turn distribution has some “simple rules” as articulated by Sacks et al. (1974) that occur at the initial transition-relevant place in a turn. I paraphrase these as follows.

Rule 1: (a) If the current speaker designates the next speaker, that speaker should take the turn at that place. (b) If no such selection occurs, then any speaker can self-select, with the first volunteer having the right to speak first. (c) If no speaker is selected, the first speaker may (or may not) continue speaking with another turn construction unit, unless or until another speaker self-selects, at which point that speaker has the floor.

Rule 2: However the participants work out the turn distribution, then rules 1a–1c are reiterated at the point of the next transition-relevant place.

If Ann's response at her projected transition-relevant place had been incorrect—if Art's invitation was for next Tuesday, he could have redistributed the turn by means of rule 1b and repaired the exchange. Even if Ann's projected transition-relevant place were incorrect, it probably would not have mattered in the context of achieving understanding. Schegloff (1992) notes that speakers project to possible not actual transition points because in natural spoken conversation the optimum condition is for as little time as possible to occur between turns. This is practical, as waiting for any speaker to finish completely would result in gaps that would erode the natural flow and meaning as well as lessen the opportunity for any speaker to enter the conversation because either someone else does or the current speaker continues.

According to Sacks et al. (1974) such rules of turn distribution are intended as descriptors of practices that speakers exhibit in the actual occasion of turn-taking in conversation; again, they are not meant to be prescriptive but, rather, are *practices* that are in evidence in transcriptions of talk.

The point of these detailed descriptions of conversational practice or use is to provide empirically grounded descriptions of how speakers interactively manage and organize communication in myriad social contexts and for an array of everyday social actions. Traditional CA has used the focus on turns to develop insightful accounts of the structural organization of topic shifts (Jefferson, 1986), agreement and disagreement (Pomerantz, 1984), laughter (Jefferson, Sacks, & Schegloff, 1987), repair and correction (Schegloff, 1986), invitations (Drew, 1984), and overlapping talk (Jefferson, 1986).

40.4.1.2 Sequential Organization and Intersubjectivity.

In CA, participants' understandings are displayed in interaction and displayed for the conversationalists chiefly through the sequential organization of turn-taking. The fact that talk-in-interaction is organized by turns leads to an important distinction for CA. Turns occur one after the other, in a serial order. However, the relationship between turns is not serial but sequential. This distinction is crucial because the talk does not just occur in a series of responses; rather the talk is organized in sequences of two or more in which conversants show their understanding of the kind of turn the prior turn was intended to be (their understanding of the turn construction). This concept is known as the adjacency pair sequence. Clear case examples are invitations that make acceptance or deferral relevant as the next move or questions that make an answer relevant as the next move. The insight here is not just that answers follow questions but that responses are conditionally relevant to utterances in prior turns. The second pair part is conditional on the first—it is normative. The normative constraints on adjacency pairs are important to CA because the researcher can draw inferences in the cases where typical responses do not occur. For example, a lack of an answer to a question may imply evasion. Moreover, the resolution of the meaning of the break in normative constraint is confirmed in subsequent turns through what in CA is called the next-turn proof procedure. Consider the following

example of a discussion between a teacher and student regarding an upcoming open house at school.

1. *Teacher:* Do you know who will be at the open house?

The question is ambiguous. It may be a legitimate request for information or it may be a preannouncement, a foundation for an announcement the speaker wishes to convey regarding who will be at the open house. In CA, the problem here is not whether the student can technically decode the utterance but, rather, how the conversants show their understanding or interpretation of the utterance. Comprehension is worked out in the next few turns.

1. *Teacher:* Do you know who will be at the open house?

2. *Student:* No, who?

3. *Teacher:* I'm asking you, I can't know who's coming

4. *Student:* Uh, oh, my mom, my dad is working

Here we see that the students' projections were not on target; the teacher was actually seeking information, not making an announcement. Based on that misunderstanding the student's response to the preannouncement was to encourage the first speaker to continue with the announcement. This example points up that the general conceptual orientation of CA is not cognitive but social. Regardless of whether the student or teacher knew (cognitively) the potential answer(s) to the question, the participants in this exchange relied on the social organization of the interaction (its context) to shape their contributions to the conversation. This process is constitutive of publicly achieved understanding and intersubjectivity.

40.4.1.3 Strategies and Goals. Despite strong ties to pragmatics and social psychology, CA takes an opposing view of the nature and relevance of goals and strategies in common everyday conversation. CA uses the many nuances and details of talk-in-interaction to observe through the empirical evidence of the exchanges in the transcript the subtleties of how communication and shared understanding is achieved. Consider this exchange between two sisters discussing an aunt's recent trip to the doctor (Mazur, 1989).

1. *Mary:* Hi: mmm::uh::Aunt Bessie called, have you talked to her↑ she (.)

2. was very↓ weak sounding and (0.7) ((sniffing sound)) well it's [not↓

3. *Claire:* [this doesn't sound good

4. *Mary:* [I waited 'til after the kids were in bed to call (.) With her history::

5. *Claire:* = [Oma had breast cancer

6. *Mary:* It's malignant. She has about six months. OH GOD ((sobbing))↑

On its face, this is a conversation about a cancer diagnosis. Note how the first speaker does not actually announce the bad news, but rather as the turns play out the recipient infers and announces an exchange that would have been impossible without the shared knowledge of the aunt's medical history. The communication was accomplished through interactive negotiation of

the information through conversational turn-taking. This is not the same as noting that Mary's strategy was to be evasive and get Claire to say the bad news. As sisters there may be other socially constrained frames on the production of this exchange; perhaps one speaker (Claire) is aware that the other (Mary) may not be able to continue with the announcement (by hearing her sniffing) even though Mary initiated the conversation and wishes to convey the information. Of course, conversants have goals and strategies and the CA perspective does not deny that they play a key part in communication. However, the interest of CA in goals and strategies is how conversants show their understandings and orientations to each other using their talk as evidence.

40.5 SOCIAL, EPISTEMOLOGICAL, AND MORAL ASSUMPTIONS OF THE CA PARADIGM

The purpose of this section is to examine the historical and theoretical roots of CA and to lay out the social, epistemological, and moral assumptions inherent in the classic CA paradigm. The section ends with some reflections on the goodness of fit of the classic CA model for conversations that occur in a computer-mediated context toward the purpose of raising issues that may arise as the CA paradigm and methods are applied to talk-in-interaction in on-line settings.

40.5.1 Sociolinguistics, Pragmatics, and Ethnomethodology

CA evolved at the nexus of paradigm shifts in linguistics toward sociolinguistics and pragmatics (Grice, 1975; Hymes, 1977) and ethnomethodology in sociology (Garfinkel, 1967; Goffman, 1963; Sacks, 1972; Schegloff & Sacks, 1973). Ethnomethodology, as first described by Garfinkel (1967), was a study of practical theorizing in everyday practices and focused on legitimizing common sense reasoning and examining procedures in common-sense activities. Schegloff and Sacks, two of the pioneering practitioners of CA, were sociology students of Goffman's (1963) at Berkeley. They followed in his interests in researching face-to-face interactions in the real-world contexts of talk and interaction. It is Sacks who is generally credited with formulating procedures that came to be known as CA through his analysis of a collection of tape-recorded calls to a Los Angeles Suicide Prevention Center.

Heritage (1997, p. 162) notes that there are currently two prevalent branches of analytic conversation research. One kind examines the institution of interaction as an entity with its own structural, social, and moral characteristics. The other prevalent type of analysis focuses on the management of social institutions IN interaction. ten Have refers to the first kind as *pure CA* and to the second kind as *applied CA* (ten Have, 1999, p. 8). Within the applied CA framework the organization of interaction (such as turn-taking, the distribution of speakers' rights, and openings and closings of conversation) can be examined. Additionally, the specific interaction situation, the local, unique interaction requirements, and how the conversants understand

and demonstrate their orientations toward these “rules” can be examined. Sacks (1974) and others were careful to articulate that these are *not* prescriptive rules but, rather, rules that develop within and *through* the interaction. Thus, within the applied CA framework, CA is a systematic method to observe the production of intention or the achievement of understandings in the turns of talk between human speakers.

40.5.1.1 Social Assumptions of CA. It is important to note that historically the CA paradigm is a decidedly *local* and *specific* endeavor. Based in the sociological perspective of ethnomethodology (described below), CA focused on the *interactions* of ordinary people talking in ordinary and naturally occurring circumstances—situations that have come to be known as talk-in-interaction. The phenomenon of interest was defined as talk in natural settings rather than formal, laboratory, or experimentally contrived situations and discourse. Based on this foundational tenet, of the local, the *in situ*, and the particular, CA is clearly a qualitative research effort. However, partially because of its relationship to linguistics and partially because of its focus on interaction (and the complexities of such activities), CA researchers realized from the first that a new methodology would be required. Until the proliferation of on-line exchanges in the form of typed “virtual” conversations, data in CA studies consisted primarily of audio recordings of talk in naturally occurring settings. The development of procedures and protocols for transcribing these data and development of frameworks for analyses of these data were crucial for achieving the systematic rigor required of any disciplined field of inquiry. Despite these efforts toward rigor that necessarily resulted in rules (practices) from inductive analysis of conversational patterns, the notion of the socially constituted, mutually understood character of conversations is paramount to implementing the CA approach. However, to reiterate a key point, the notion that conversation is normative does not mean that its structures and “rules” are prescriptive. This is certainly the case because all conversation is contextualized by the social circumstances in which it occurs and thus prescription is precluded.

40.5.1.2 Epistemological Assumptions of CA. The epistemological perspective of the CA paradigm appears to be somewhat ambiguous. However, I would assert that this ambiguity is both ironic and semantic, directly related to the very focus of CA—words. As I have alluded to in previous sections, the use of such terms as rules for turn distribution gives the CA a prescriptive, frame that not evident in the actual conduct of CA research. As Sacks conceded, the use of these terms is unfortunate and he could have just as easily described such rules as practices, thereby countering the algorithmic, predictive connotation. CA is interpretative, with an emphasis as on the local and the particular. Although (as the reader will see) CA methods are circumscribed by very specific procedures, the practice of CA analysis is largely inductive. The CA researcher, working within the classical CA tradition, confines the basis for analysis to the transcribed text in naturally occurring settings. Based on the evidence of the transcript of the actual recorded conversation, the CA researcher discerns patterns in talk, using primarily the strategies related to case analysis—clear case, discrepant case,

and the like from the transcription. Meaning is inferred in the context of the social interaction of the coconstructed conversation. Clearly the relationship of the knower to the known in the CA analytic process is a mutually constitutive one. The CA analyst is “reading” the transcript, which has distinct features related to turn-taking and structure, and bringing her own interpretative frames and lenses to this task. The analytic task is recursive and folds back on itself. This recursion occurs not only in the context of the actual dialogic expressions that are interdependent (the discursive relativity principle defined by van Dijk), but also in the procedure of the researcher in moving back and forth within the data, confirming or denying clear and discrepant cases.

40.5.1.3 Moral Assumptions of CA. The moral perspectives inherent in CA are impulses toward equity and multivocal participation, in the privileging of the actual voices of participants in everyday settings. In particular, in the case of critical social analysis, the expressed purpose of the analytic effort is toward understanding deep-seated or hidden power relations evidenced within the talk-in-interaction. Morally, findings from these types of CA have great potential to raise issues of status, empowerment, silencing, and other forms of oppression. Taking Austen at his word, that speech is action, critical feminist philosophers have examined the power of hate speech as an insidious means to shape attitudes and prompt action (Callahan, 2001). Critical social analysis in CA can provide powerful evidence from everyday talk for the necessity for change.

40.6 TECHNOLOGY AND CONVERSATION

40.6.1 Technology-Involved Conversation

Defining the parameters and participants in technology-involved conversations has been greatly complicated over the past three decades by advances in computer science that have appropriated intricate psycholinguistic and psychomotor models and applied them to the design of interactive computing technologies, in both desktop and networked environments. Thus, it is important to distinguish in a general sense between two terms, often used interchangeably, and to settle on the use of one for the purpose of this review. These terms are *computer-mediated communication* (CMC; cf. the chapter on CMC in this handbook) and *human-computer interaction* (HCI; cf. Suchman, 1990). Computer-mediated contexts include e-mail, digital videoconferencing, asynchronous threaded discussions, and real-time chats. (HCIs can relate to the technologies described above with reference to CMC) but use a distinctly different metaphor to describe the relationship between human and machine. Rather than mediational descriptors (computer-supported, for example), the emphasis is on interactional descriptors. Thus, in HCI, humans’ interactions with machine can be characterized as “conversations” by denoting the sequencing of “give and take” involved in the use of expert systems as “turns.” The computer anticipates and responds to users’ actions. For example, in the HCI paradigm, machines “interact”

with humans by beeping announcements of the arrival of new e-mail. Remarkably, in an extension of the HCI framework, machines can also “talk” to other machines as in the case of enforcing constraints on automated “computerized” stock market trading. The information in this chapter is confined to the tools of CMC as defined by Romiszowki and Mason (1986). However, although an analysis of useful overlaps in the HCI literature (cf. Jacko & Sears, 2002) and CMC is beyond the scope of this discussion, there are unquestionably concepts from that discipline that can relate directly to the conduct of a conversation analysis focused on talk that occurs in on-line settings. One such concept is the notion of an “affordance” as advanced by Gibson (1979).

40.6.1.1 Affordances and On-Line Talk. Technologies are not neutral (Ellul, 1964). Communication technologies affect the quality and conduct of conversation and interaction. There is a complex relationship between the normative structures of conversational interaction and the communicative affordances of various forms of technology (Hutchby, 2001). The notion of an affordance is drawn from the perceptual psychology work of Gibson (1979). Affordances are possibilities for action that are suggested by the physical features and inherent properties of objects. For example, door knobs afford grasping and pulling, telephones *afford* grasping and talking and listening, and wireless headsets make it possible to eliminate the action of holding the phone. Gibson emphasized that affordances can enable or constrain based on their physical properties. These properties are not interpreted by human actors but, rather, are real, material dimensions of objects. Humans perceive affordances based on these physical properties and these properties do not change regardless of how the object is used. Specifically, in one of Gibson’s classic examples, the “grasp-ability” of the door knob does not depend on someone’s opening or closing a door. An examination of the material aspects of objects is important for conversations in CMC, particularly in reference to the potential to enable or constrain the ways in which a conversation is carried out. For example, speech is simply not possible in a threaded discussion or bulletin board conversation where typed text is the method by which exchanges occur. The chat window and the distance between client and server machines affect turn-taking and the sequential organization of the on-line “typed” talk. These characteristics of the talk-in-interaction relate to the affordances of the technologies used and these affordances need to be considered as part of the context of the conversation.

Interestingly, it was distinct affordances of the new audiovisual medium of the tape recorder that proved critical to the initial development of CA methodology. The audio tape recorder made it possible to access actual speech as raw data and to support systematic and rigorous research in ethnomethodology (ten Have, 1999, p. 8). After Schegloff and Sacks broke away from the examination of formal discourses and planned interaction to focus on everyday conventions and social interaction, the actual documentation of these conversations remained a problem to be addressed. By using more portable audiotape recorders just being commercially mass-produced at that time, documentation of field conversations was possible. Currently we have similar “revolutionary” means for the documentation of on-line conversations. Computer tracking utilities (Gay &

Mazur, 1993; Misanchuk & Schwier, 1992), network proxy log aggregation (Watt, 1999), text archives of on-line chats, and bulletin boards, and e-mail as well as other kinds of internal computing devices for recording screen actions and sound (Gay and Bennington, 1999) are among the tools available. The use of these new tools is discussed later, under The Researcher’s Toolkit.

40.6.2 Virtual Conversation: The Special Case of Text-Based On-Line Conversation

In text-based CMC such as synchronous chats, asynchronous bulletin boards, or threaded discussions, the participants affect “talk” by typing in their “speech,” and the Internet Relay Chat (IRC) or threaded discussion software archives the interactions via a text-based, time-coded transaction log. Thus, conversation analysts are challenged to consider these virtual conversations as potentially rich sources of data about how on-line learning, instruction, or work may occur. Theoretical discussions of the status of virtual conversations have just recently begun to surface in the CA literature (Hutchby, 2001). Issues such as interpersonal relations, social identities, and frameworks for participation have been researched (Jones, 1995). Garcia and Jacobs (1999) conducted a comparative analysis of turn-taking in a synchronous chat with the two-party turn-taking structures identified by Sacks et al. (1974) that revealed that these virtual conversations indeed (a) have normative characteristics, (b) exhibit unique forms of expression, and (c) contain procedures by which newcomers to the conversational environment are initiated in the use of both a and b. For example, the chat environment differs from dyadic face-to-face conversation norms in that simultaneous, multiple-party turn-taking is possible. Nonetheless, conventions for turn-taking exist and it is possible to achieve coherence through the turns in talk. The on-line talk is influenced by the affordances of the chat technology and interface (such as the window to enter talk on the speaker’s screen and the public display of all entries on a shared scrolling collection window). Figure 40.1 shows the affordances of a typical chat interface from Blackboard, a widely used Internet course management software package.

Hutchby (2001, pp. 183–184) found four ways (paraphrased below) in which virtual conversations on an IRC differ from face-to-face conversations.

1. Participants can take a turn only by entering text in the text line box and pressing the enter key.
2. There is a temporal lag. The “turn” reaches others only when the sent message is accepted and distributed by the remote server.
3. The lag described in 2 results in disjointed sequential relationships between when talk is produced and when it is “enunciated” or displayed on the public talk space.
4. While all of the above is happening, the conversation is conducted in a scrolling window on the shared public space. Depending on the volume of traffic to the server, prior contributions tied to a specific response or turn may scroll off the screen by the time it reaches the public display.

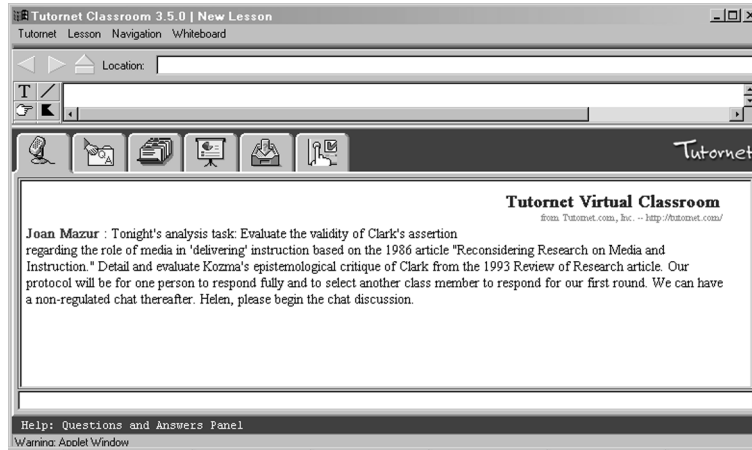


FIGURE 40.1. The Chat tool from the BlackBoard Virtual Classroom feature.

This leads to multichannel conversation that develops coherence through specific word-based strategies such as “naming” (directing a comment to a specific speaker’s previous comment) or through the use of another sensory resource: sight. By looking at the text, speakers (as reader/listeners) can maintain turn-taking and develop coherence, even in light of the disappearing scrolling text. These distinct features of virtual conversation imply the need for specific transcription techniques when using the archive of an on-line chat as a data source. These conventions are necessarily still evolving, but some specific strategies that have been employed (Egbert, 1997; Garcia & Jacobs, 1999; Herring, 1999; Hutchby, 2001; Mazur and Jones, 2002) are discussed in the sections on data preparation and transcription that follow.

Unique forms of expression, emoticons, have evolved that approximate sociolinguistic components of speech in text-based talk. Emoticons are iconic representations of emotions that are interspersed with the text-talk to indicate a range of affective responses such as displeasure, :(, or surprise, >:-o. In fact, the use of some emoticons has become so routine in text-based communication that many word processors default to an automatic insertion of a graphic happy face ☺ when one types a :).

As regards initiation into the conventions of on-line talk, any search engine query for Netiquette reveals standardized norms for communicating in text-based communication environments and neophytes to an on-line forum are warned about participation rules, usually including sanctions for “spamming” or other inappropriate behaviors.

40.7 CONDUCTING CA RESEARCH: RESEARCH QUESTIONS AND DATA COLLECTION AND ANALYSIS

The purpose of this section is to lay out in practical terms some of the procedures for conducting a CA for talk that occurs in computer-mediated contexts. These procedures are meant as

guidelines rather than formulas or recipes because, as must be clear to the reader by this point, there is much to be explored in both the theoretical and the methodological arenas concerned with the analysis of on-line conversation in its many situated occurrences. Issues related to developing central questions, sampling, data collection, and preparation and data analysis are the topics discussed.

40.7.1 Develop Focus Questions for Research Related to Naturally Occurring Talk

The design of a CA study is similar in approach to any qualitative research design and includes these characteristic features: formulating initial focus questions related to talk-in-interaction, making a plan for obtaining or making recordings of *naturally occurring* interactions, transcribing or obtaining a transcript (in the case of the text archive of an on-line chat), developing inductive, analytic strategies, and elaborating the analysis in conclusions and implications. Questions such as those raised in the Introduction are among those that could be addressed through a rigorous analysis of on-line conversation as it applies to how learning and instruction proceed in these contexts. In the sections that follow specific issues related to CA data collection and analysis are discussed: sampling, collecting, and producing records of conversation, transcription, and other preparation of conversation records.

40.7.2 Sampling Using a “Specimen” Approach

In an insightful discussion of sampling Alasuutari (1995) elaborates on an important methodological point related to the distinctive sampling procedures used in CA. Sampling, in the quantitative sense, represents what he calls a *factist* perspective. This factist perspective is contrasted to what he terms a *specimen* perspective. In the factist approach, sampling is required because the reality under study is not observable and thus

indicators of parameters of a population are specified to determine the sample. A researcher cannot directly observe opinions and thus uses a survey to ascertain them from a subject pool. Consequently, to make the results generalizable to the entire population, the sample must be representative.

Using a specimen approach, drawn from techniques in naturalist observation and biology, the reality under study is directly observable in the particular individual. For example, a biologist examining a species of tadpoles would simply choose individuals from that species. Perhaps, by observing the species in some natural setting, the biologist would not choose one that seemed highly unusual, but there would be no need for a statistical sample of tadpoles, as it is the category of species, the specimen, that is of interest. Similarly, a CA study might focus on any *category* of talk-in-interaction such as repairs and then simply select any specimen of conversation generated in a naturalistic setting. As Hutchby (2001, p. 51) has claimed, “The logic of CA, however, in terms of data selection suggests that *any* [his emphasis] specimen is a ‘good’ one, that is, worthy of intense and detailed examination.” From a common-sense perspective as well as from the key disciplinary tenet of CA that conversation has normative dimensions, one can imagine that in any specimen of a data log from an on-line chat one might expect to find exchanges to examine such as greetings, announcements, repairs, and the like. How these types of exchanges are accomplished by conversants using typed, synchronous, or asynchronous postings of text would be an insight that a conversation analysis might illuminate.

40.7.3 Collecting/Producing Records of Conversation

The most important caveat for collecting and producing data for CA is rooted in the concept of *naturally occurring* conversation. Regardless of how it is produced or recorded, the data for CA are always in a sense “primary sources” of talk-in-interaction. Although the more general field of discourse analysis might potentially consider descriptions of witnessed talk-in-interaction as data, those types of accounts would not be considered appropriate for CA. Following is a list of sources of CA information that are typically used to analyze talk-in-interaction. For a discussion of the potentially intrusive effects of recording equipment and how such devices affect the behavior of participants and the natural setting of data collection, the reader is referred to Chapter 39, on qualitative research.

40.7.3.1 Audio Recordings (Analog and Digital). As previously mentioned audio recording, whether analog or digital, was for many years the essential and required source data for CA. Audio recording captured actual speech and recorded the natural sequencing, intonation, and content of conversation. Digital recording has improved on the original method in two key ways. Digital recording maintains its high quality despite repeated playback. Specimens can be more easily selected from the complete conversation because of both random access and the capacities of some tools (such as iMovie software for the Macintosh) easily to provide time-stamped recordings. In computer-mediated contexts such as distributed audio or video

conferencing, analog or digital audio recordings of actual speech continue to be a viable means for documenting interaction.

40.7.3.2 Video Recordings (Analog and Digital). Perhaps simply because of the tradition of using audio recordings, video recordings of talk-in-interaction are not the preferred device of CA researchers, though some recent researchers have been working with video transcripts and have done much to advance the use of video transcripts (Goodwin, 1995; Heath, 1997). In addition to visual aspects of interaction (such as noting gaze, which has been related to turn distribution), video is particularly appropriate when aspects of the physical setting of the conversations are intrinsic to the conversation such as engineers discussing design models. Gestures and other body language are often highly relevant in the context of social activity. In computer-mediated contexts such as distributed digital videoconferencing and compressed video, analog or digital video recordings are a viable (and relatively untapped) means of documenting interaction.

40.7.3.3 Text Logs from On-Line Forums (Synchronous or Asynchronous). Transcriptions of audio or video recordings were for decades the primary source of CA data, and the process of transcription is a time-consuming and arduous task. In today’s worlds of CMC, perhaps from some impulse to make the virtual more real and, more practically, because the conversations often occur via the use of typed text that is exchanged between and among on-line conversants, massive text logs of synchronous and asynchronous chats and bulletin boards are available for CA. To prepare a text log “transcription” many modifications to the traditional CA conventions are required. However, the text logs themselves contain “naturally occurring” conversant-generated indications of some of the sociolinguistic dimensions evinced in recordings of speech. The use of emoticons—typed graphics such as ;) to indicate a textual “wink,” are an example of this phenomenon quite prevalent in text-based on-line conversations. A discussion of issues regarding transcription for on-line talk is contained in a section that follows.

40.7.3.4 Digital Screen Recordings of On-Line Interactions (Screen Playback). Some kinds of on-line conversations take place within the virtual space of the desktop such as point-to-point videoconferencing. MSN Messenger and Yahoo are two Internet Service Providers who offer on-screen services of this type. Using an inexpensive, small eyeball camera, conversants can engage in computer-mediated face-to-face talks. Using a screen recorder such as HyperCam that captures screen images and stores them as digital movies, a researcher could conduct CA on these types of conversations. Using these types of tools, however, will also require transcription and modifications to the more traditional conventions. For example, transcription conventions such as the use of the symbol (.) to indicate a microsecond pause or the use of parentheses with the numeric symbol (0.7) to denote time delay in talk have to be amended to denote when pauses” are related to technical affordances such as network bandwidth constraints or are actually “pauses” in the conversation. Of course, these technological constraints

become part of the social context of the talk and become part of how participants “project” turn constructions, which are participants’ determinations of transition relevant places and turn distributions.

40.7.4 Transcription and Other Preparation of Records of Conversation

40.7.4.1 Classic Transcription of Audio and Video Recording. Any discussion of classic CA transcription convention credits Gail Jefferson (1972) with developing the canon of transcription conventions that continues to have utility in the preparation of transcribed verbal interactions to the current day. Table 40.1 contains a modified listing of these standardized conventions. The purpose of this table is illustrative, not exhaustive. Jefferson developed many indicators of nuance and was always alert to opportunities to add to conventions as they played out

TABLE 40.1. Excerpts from Gail Jefferson’s Transcription Conventions

Sequencing	A single left bracket indicates the point of the beginning of the overlap.
	A single right bracket indicates that the point of the utterance or utterance part stops with reference to another utterance.
=	Equal signs, one at the end of a line and one at the beginning of the next, indicate no gap between the lines, often referred to as “latching.”
Timed intervals (0.0)	The number in parentheses is the elapsed time in silence by tenths of a second. For example, (2.5) is a 2.5-s pause.
(.)	This indicates a miniscule gap pause in or between utterances.
Speech production <u>Word</u>	Underscored words indicate a form of stress in pitch or loudness; sometimes an alternative is used, printing the stressed part of the word in <i>italics</i> .
::	Colons are used to indicate elongation of the immediately preceding sound. Multiple colons are used to indicate a more prolonged sound.
..??	Punctuation marks are used to show characteristics of speech production. For example, question marks are used to show rising intonation; a period to show falling intonation; and so on.
↑↓	Arrows up or down show rising tone, pitch, amplitude in words.
WORD	Uppercase letters are used to show especially loud sounds compared to words preceding or following.
Transcriber doubts ()	Empty parentheses show that the transcriber could not hear words.
(())	Double parentheses show the transcriber’s additions or descriptions, not actual transcription.

in specific social contexts, such as joking, directing, evaluating, and other social or cognitive functions of talk. As the reader will note, the inclusion of sociolinguistic elements such as raised tone of voice presumes either an audio or a video record of the conversation. In the case of CA for computer-mediated contexts such as audio and video conferencing, these same kinds of conventions would certainly be applicable, with modifications for affordances of the technologies as discussed in a previous section.

These transcription conventions show the arduous task of transcribing talk from speech in naturally occurring situations. The goal of the transcription is to capture descriptively as many dimensions of the talk as is observable in the specimen. By articulating these minute dimensions, the conversation analyst aspires to understand how these dimensions work in concert to create a normative, meaningful interchange.

40.7.4.2 “Transcription” of Real-Time Log Data for Text-Based On-Line Conversation. The task of working from the “transcription” of an on-line, text-based talk-in-interaction differs from the task of transcribing actual natural speech that may be conducted using CMC, although both instances are legitimate subjects for CA. The on-line record of the synchronous chat archive is already in a text form, obviating the process of transcribing speech. However, the logs may still be in need of processing that approximates the conceptual task of transcription, which is to provide descriptive detail to the words to assist in analysis of the normative characteristics of the talk-in-interaction. Do examples of such processing of on-line archived texts exist in the literature? Hutchby (2001, p. 178) uses an arrow to focus on a speaker and threads in a multiparty conversation from on-line chat. In the example in Table 40.2 of a chat from my own data, turn-taking is indicated by an arrow (pseudonym initials replace users’ actual names). In addition to indicating turn-taking in a thread of conversation, one can also note the use of capital letters by DT when she types the word TYPO! indicating emphasis. Actually, DT is conducting nearly simultaneous threads with RD and LN. One of the most important methodological issues when preparing a chat archive transcript is to indicate clearly, through the use of a Key, the emoticons or typographical “inflections” of participants and those such as the arrows used to indicate the turn-taking thread between LN and DT inserted by the researcher for purposes of analysis.

Clearly the conventions developed by Jefferson and elaborated on by countless researchers in the CA tradition need to be modified and extended for documenting the range of social action accomplished through talk in these on-line contexts where multithread, multiple-participant conversation is possible. For example, in a recent analysis, the use of a *conversation map*, a technique that built on the work of Levin, Kim, and Riel (1990) using message maps and Herring’s (1999) multiple-thread schematics, was helpful to orient spatially the various topic threads occurring over time in a synchronous chat (Mazur & Jones, 2002).

40.7.4.3 Documentation of the Affordances and Conventions of the CMC Forum Environment. In preparing the data for analysis it is obviously crucial to describe thoroughly the

TABLE 40.2. Excerpt from an On-Line Chat Used for Teacher Professional Development (Mazur & Jones, 2002)

RCMC:120300	
1	RD: What are you currently doing in class?
2	DT: Just finished the Connected Math unit "Prime
3	Time"—dealt with factors, multiples, LCM & GCF. Will be
	beginning the unit
4	"Bits & Pieces" this
5	week—decimals, fractions & percents. Also, we are very
	heavily using Accelerated Math
6	RD: I don't know whether you looked at Pizza Pirate,
7	but that activity was chosen for doing decimals, fractions,
	and percents.
8	RD: welcome back LN
9	RD: When you come back like that, do you see the
10	comment by DT about she has just been doing in class?
11	LN: I accidentally hit refresh.
12 →	LN: Yes, I'm not familiar with this material, but I'd
13	like to learn more.
14 →	DT: Yes! I have used it in the past and emailed class
15	members trying to find it again. I cannot locate mine. PR
	and I were
16	wanting to use it with
17	a class we are teaching as part of our 21st CCLCI
18	RD: OK, I had no idea who are requested it because I
19	didn't recognize the username.
20 →	DT: RD, Would you possibly be able to find a
21	hard copy of Pizza Pirate?
22 →	LN: What is the 21st CCLCI?
23	RD: Of the problem statement?
24 →	DT: TYPO! 21st Century Community Learning
25	Center

affordances and known conventions or normative behaviors of the computer-mediated conversational environment. This means articulating the communication channels such as audio, visual, or textual and, in the case of most on-line newsgroups, chats or bulletin boards, articulating the posted or known "rules" for engagement (so to speak). Also, it is important to ascertain the possible roles that participants may have in the computer-mediated context. For example, participants may be ordinary speakers, moderators, sysops (system operators), chanops (channel operators), or other roles within the formal computer-mediated system.

The necessary linear presentation in the preceding sections on data preparation belie the interactive, inductive nature of conversation analysis. Although it is useful to use a word processor to number lines and to search and replace names with pseudonyms, for example, the process of grounding theory in the data and the particular circumstances of the observed phenomena is an iterative one. Once data are produced, collected, and transcribed, how exactly might one proceed with the analysis?

40.7.5 Steps for Conducting an Analysis of Conversation

In CA, the analysis proceeds from the perspective of what Psathias (1995) has referred to as "unmotivated looking (p. 45)."

The purpose of this posture toward the data is to affect openness toward induction. The stance is neither atheoretical nor naïve with respect to acknowledging the frames or biases the researcher brings to the qualitative task. Rather, this stance of unmotivated looking is simply a way to achieve an "examination not prompted by pre-specified goals" (Schegloff, 1996).⁷ Given this general frame on the analytic task for conversation analysis, how might one proceed?

Several researchers in many contexts have offered suggestions for the task of systematically analyzing conversation (Pomerantz & Fehr, 1997; Schegloff, 1989; ten Have, 1999). I have summarized and synthesized the work of these three researchers, whose works offer the most concrete suggestions for doing a CA that I have read.

40.7.5.1 Select a Sequence. Select either a purposive or an arbitrarily selected segment of a transcript and carefully read and reread the segments, focusing on how the talk is organized. Sequences can be difficult to define, especially in multithreaded on-line conversation. A good tip is that a sequence has usually ended when speakers are no longer responding to a prior action (initiation, repair) or topic. Stay open to the possibility that discrepant cases involving unusual initiations or cues or unusual closures that spur other sequences may be in evidence.

40.7.5.2 Characterize the Sequence. Answer the question, "What is the speaker doing in this turn?" What is the topic of the conversation? Is the person trying to initiate, repair (clarify, elaborate), or close an interaction? Keeping in mind that the interpretations of the action may change as the analysis proceeds, try to understand what is accomplished in the turns (Does the speaker try to get the floor? Is the attempt successful? What reference terms are used? How does the talk set up options for recipients?). What is the meaning of the interaction? How is meaning conveyed, received, coconstructed through interaction? What do participants talk about, and how do they signal topic changes or the need to stay on a certain point? Understanding the purpose of the turn can be a complicated task, and inference is necessarily ambiguous.

40.7.5.3 Consider the Rights, Obligations, and Expectations Constituted in the Talk. In the course of establishing conventions within talk-in-interaction, inferences can be drawn about the identities, roles, and relationships among and between the participants. These conventions are often obvious in who initiates topics, who closes sequences, and the ways in which these closures or initiations are understood by participants. Aspects of how talk can be used to mount a social critique within the context and issues related to social status as it plays out in talk often emerge within this dimension of analysis. Keep in mind that silence has a powerful voice in conversation and that, as is often the case in qualitative analysis, what is not present can be as telling as what is.

By reading and rereading and focusing in on particular dimensions of conversation such as the sequences of turn-taking or repairs that support topic shifts, the conversation analysis proceeds. Observing and documenting unique patterns that

become conventional modes of interacting to inquire, confirm, contradict, or elaborate discussed topics is at the core of the analysis of conversation.

40.7.6 Ethical Considerations When Collecting Conversational Data

40.7.6.1 The Notion of a “Public” On-Line Forum. Even though an on-line chat or forum may indeed be “public,” that is, the chat logs are archived and available for group inspection, it is important for the researcher to maintain an ethical posture toward informing participants that their work will be the subject of an analysis either by a “participant-observer” or by an external researcher. Additionally, even if access to an on-line conversation is “password” protected, it is still possible to be in virtual attendance without the specific knowledge of the participants. This can occur most easily if the researcher obtains a password or permission to join the on-line conversation from the facilitator but not the participants. Unless there is a specific, conceptually justifiable rationale to deceive participants, I recommend obtaining permission to participate or view retrospectively conversational data in on-line chats or discussion forums. On-line information is highly accessible and it is (perhaps) too easy simply to print it off and import it into your word processor as electronic text overlooking a critical tenet of ethical research, informed consent.

40.7.6.2 Requirements for Informed Consent from Participants. In checking with the Institutional Research Boards (IRB) at several Carnegie Research Institutions, I was told that publicly available data, that is, public chat forums or discussion boards that *do not* use passwords, *do not* require informed consent of participants or any contact with the IRB. However, when a password is required to participate, some expectation of privacy is inferred and thus a researcher should take steps to obtain informed verbal or written consent as deemed appropriate by the governing IRB. Regardless of whether the research is conducted as part of university work or for independent consulting firms, ethical issues need to be considered. As an example, to conduct a CA of an on-line chat (which required a password) used for professional development by middle-school mathematics teachers, I first contacted the university faculty moderator by e-mail, then via a phone interview (Mazur & Jones, 2002). After explaining the purpose of the research, supported by an independent, nonacademic business leadership group interested in educational change, I asked the moderator if he would introduce me to the chat group and elicit their consent for me to “lurk”—my intention was to observe, not participate in the chat. Finally, I requested that the moderator ask chat group members to e-mail their verbal consent to me “off-chat” to deter any implication of pressure to comply by requiring that participants publicly accept my participation and monitoring of the group’s on-line chatting. In this case all of the participants consented. Had a participant refused consent, I had decided that that person’s talk would not be included in any analysis. However, I did not have to deal with that issue. The extent to which excluding

segments of conversation based on a participant’s failure to consent affects the overall CA remains an open methodological question.

40.7.7 A Case Example: Conducting a CA of an On-Line Chat

The conduct of a CA is a time-consuming and detailed task. The analysis of 9 months of a once-weekly 2-hr chat took this author and a graduate assistant 6 months (and there remains an additional year of chats to analyze!). To give a concrete example of CA in a computer-mediated context, I outline below the steps we took to conduct the CA of this particular on-line chat. The chat forum was used for ongoing professional development and follow-up to a middle-school mathematics teacher academy (Mazur & Jones, 2002). A cautionary note: The step-by-step approach detailed here is intended to be succinct and informative and is *not* intended to be formulaic or prescriptive. Although I believe that these procedures are essential elements of a CA, they are by no means all inclusive or mandatory. The character of the particular forum and the context in which it is situated should be overarching frames for deciding on the procedures that will yield the richest analysis.

Of course, any inquiry begins with *a question*. For this study our question was “How does the teachers’ talk (within the chat environment) support/hinder the development of a community of practice as defined by Wenger (1999)?” our procedures in this case are outlined below.

Step 1: Obtain Required Permissions to Observe or Participate in the On-Line Forum

For this case, research done external to a university environment, formal IRB approval was not required. However, permissions to observe the forum were obtained from participants nonetheless through an appeal for introductions and permission to the forum moderator.

Step 2: Compile the Entire Record of the On-Line Talk

The chat archives were accessed, and with the use of a word processor for cutting and pasting, we compiled the entire 10 months’ of weekly chat interactions into a single text record (the transcript) of the chat.

Step 3: Prepare the Transcript for Analysis

The complete chat record was “scrubbed” of identifying data and electronic text “noise” such as symbols like <email address> that made reading the text difficult. Be careful *not* to delete emoticons, etc., that are cogent to the meaning of the text-based conversation. Decisions were also made about changing actual names or “handles” to initials to ensure anonymity further. The lines for the complete record were numbered and dates were converted to numerics (e.g., January 3, 2001, was 010301) to denote sections of chat “sessions.” See Table 40.2 above for an example of the cleaned data.

Step 4: Read the Transcript

We read the entire transcript to familiarize ourselves with the participants, content, and other elements of the chat. During this initial read one can begin to be cognizant of turn-taking, who is talking, what topics are being discussed, the length of sessions, and the like. This particular chat had from 7 to 15

regular participants. Summaries of the chat logs were developed. The following summary of data was compiled from the entire 10-month chat log. This summary reports the following information: the dates participants went on-line to chat (or attempt to chat), the number of participants in the chat room at one time, and, finally, the number of minutes the chat was active.

Dates of conversations (or attempts):

- a. 9/24 (attempt/2 participants)
- b. 9/25 (attempt-time to meet suggested/2 participants)
- c. 9/26 (attempt-time to meet established/1 participant)
- d. 9/27 (full conversation/1 participant w/facilitator; 55 min)
9/28 (attempt, full conversation w/facilitator and 1 participant, 16 min)
- f. 10/02 (full conversation w/facilitator and 1 participant, 20 min; 1 participant attempted afterward, 16 min)
- g. 10/05 (4 participants w/facilitator, 76 min)
- h. 10/12 ((4 participants w/facilitator, 64 min)
- i. 10/13 (attempt/facilitator waited 12 minutes after check in)
- j. 10/19 (5 participants w/facilitator, 141 min)

There are, of course, much larger chat forums that would require the researcher to observe or participate for a specified period of time (a week, a month, etc.). Then data-based decisions to focus on several specific participants or on one topic or day, etc., might be in order.

Step 5: Define the Sample "Specimen"

Related to Step 4 is the decision regarding the "specimen" sample. In the case of the middle-school math teachers' chat, a content specimen (that involved two, 2-hr consecutive weekly chats) was selected that focused on the discussion of the classroom implementation of an activity related to proportional reasoning using a pizza pie as a "manipulative." Because the purpose of the on-line chat was for professional development and to build an on-line community of practice (1999), we were interested in their use of conversation to learn, use, or discuss content.

Step 6: Analyze the Specimen: Examine the CA Elements

With content in the defined specimen as the frame, we examined the specimen for exchanges (greetings, repairs, etc.), turn-taking and sequencing, and related conversational elements (expressions of emotion). We also used Burnett's (2002) typology of exchanges to characterize the participation in the online conversation.

Step 7: Contextualize the CA Theoretically

Because the analysis in this case study was focused on how participants *used* talk to share or learn content and build a community of practice (Wenger, 1999), elements of CA such as turn-taking and sequencing were related to how they supported development of a community of practice along each of four dimensions: identity, community, practice, and meaning. Thus, the highly consistent rules and interactions regarding patterns in greetings when participants entered the chat were related conceptually to the development of community (learning as belonging according to Wenger). The normative characteristics of participants' conversations comprised the specific evidence of the development of a community of practice through their talk.

This case illustrates one approach to the use of a specific on-line chat for teacher professional development. A subsequent

section, Research Synthesis, further explores additional possibilities for using on-line conversations as a basis for understanding the experiences of participants in a variety of on-line communication forums.

40.8 THE RESEARCHER'S TOOLKIT: HARDWARE, NETWORK TOOLS, AND SOFTWARE FOR CA

When Renata Tesch wrote *Qualitative Research: Analysis Types and Software Tools* in 1990, she legitimized the use of computer software for the qualitative analysis of complex, richly layered narrative, interview, and/or observational data. These tools have continued to improve and today educational technologists who embark on CA have many options for their toolkit. Moreover, very recent advances in digitizing audio and video have addressed some mundane, but critical, issues in data manipulation. For example, the erosion of quality inherent in analog magnetic audiotape data reproduction through multiple replays and the difficulties in precisely locating information inherent in the use of analog recording technology are obviated by digital audio records. In the following sections I discuss several (but by no means do I claim all) tools that may be useful for CA.

40.8.1 Word Processors

The remarkable functions of the word processor to process text-based data of all kinds clearly make it a key tool for CA. Features typical in all current versions of word processors include line numbering, search and replace, and symbol and character maps, and myriad options for formatting and displaying text representations through the use of tables, inserted graphics, and other text enhancements are invaluable for processing data for transcriptions used in CA.

40.8.2 Qualitative Text Analysis Programs

Qualitative text analysis software such as ATLASi (Scolari, 2002) and NVIVO (QSR, Inc., 2002) may also prove useful for CA. These types of programs provide tools for coding and restructuring the data along categorical dimensions defined by the researcher. Using this kind of software, which typically utilizes multiple windows to categorize, link, and sort data, it is possible to develop graphical "tree" displays of related text data chunks and to group data in "families" to support complex analyses. ATLASi (Fig. 40.2) can accommodate audio and visual data.

Although this author has used these programs for various projects, CA has not been among them. Certainly grouping exchanges, turn-taking, multiple threads, or message content graphically might prove to be very illuminating examples of how these tools can be used for documenting and categorizing conversations. Candidly, I would note that some users report that these kinds of programs do have a rather steep learning

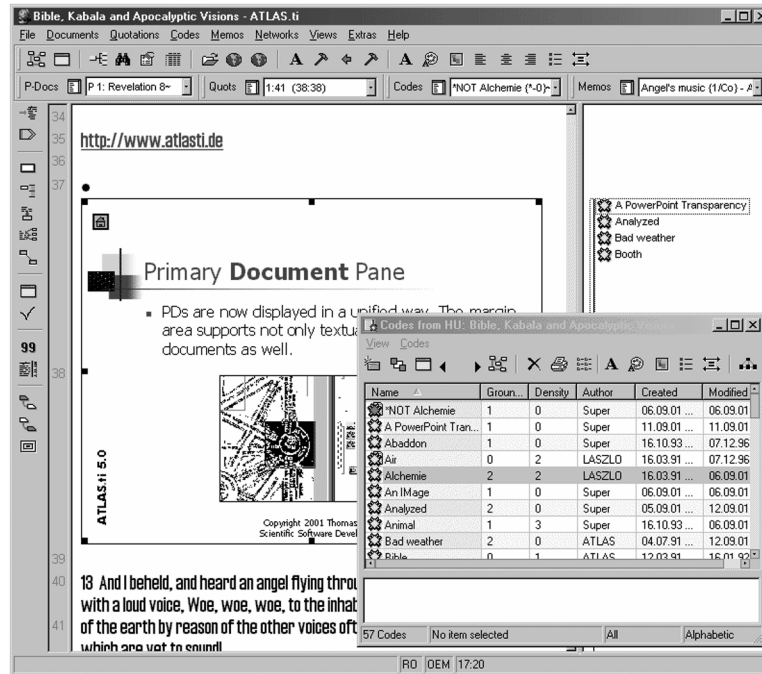


FIGURE 40.2. The ATLAS.ti interface displaying numerous features and tools for categorizing and relating qualitative data.

curve; the CA neophyte may find word processors just as useful for many kinds of analysis tasks.

40.8.3 Graphical Cluster Displays of “Neural Net” Text Data

CATPAC is software described by the program’s creators as

a neural network program that has been designed to read and understand text of any kind. CATPAC, available at <http://www.thegalileo.com>, works by learning the interrelationships among words and phrases in the text, and can identify the underlying concepts in a text after only a single reading.

CATPAC works by sliding a window through the text, typically seven words at a time, so that the window will first contain words 1 through 7, then words 2 through 8, and so on. Each word that CATPAC “sees” is associated with an artificial neuron in the program’s simulated brain. Whenever two or more neurons are “active”—that is, present in the window—the connection between them is strengthened by a small amount. Connections are also weakened through a simulation of forgetting. The program has the capacity to generate a “dendrogram,” a graphical display of the density of the text as shown in Fig. 40.3.

I have included this tool because I suspect that it has untapped potential to assist in the analysis of conversation transcripts. For example, a recent study of the content of an on-line community of practice used this tool to examine the density of the discourse on various topics (deLaat, 2001).

To use text excerpts in CATPAC an ASCII text is required and thus the possibility of stripping out key transcription tags is

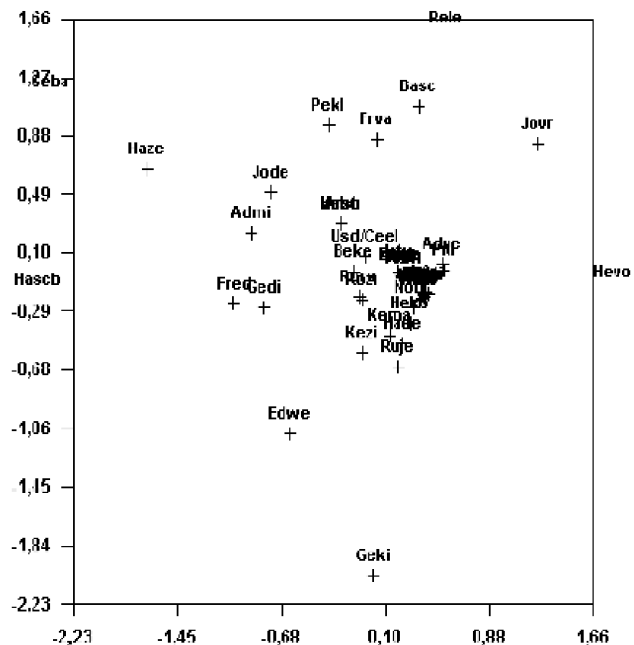


FIGURE 40.3. Graphical CATPAC display shows the density of word occurrences arrayed on an arbitrary scale that denotes relationships of themes or codes (adapted from deLaat, 2001).

possible. Certainly, clusters of certain text representations such as emoticons might prove useful as part of a CA.

40.8.4 Transcription of Video Data

Transana, software developed by Fastnach and maintained by D. Woods and at the University of Wisconsin Center for Education Research, is available as a free download at <http://www.transana.org>. According to the Web site description, Transana

facilitates the transcription and analysis of video data. It provides a way to view video, create a transcript, and link places in the transcript to frames in the video. It provides tools for identifying and organizing analytically interesting portions of videos, as well as for attaching keywords to those video clips. It also features database and file manipulation tools that facilitate the organization and storage of large collections of digitized video.

Be cautioned that the download contains digital video examples and is in excess of 80 Mb. The Transana screen is shown in Fig. 40.4.

40.8.5 Computer Tracking Logs

The internal archiving features of any text-based on-line chat, bulletin board, newsgroup, or threaded discussion are

essentially time-and date-stamped text logs of the typed-in talk. The software for these on-line forums typically keeps track of general use statistics such as how many users participate (often astonishingly high numbers, in the thousands in any 24-hr period), the type of conversation tool used (a synchronous chat or asynchronous threaded discussion), and the amount of time spent in the forum. Without the specific text of the conversation, such “statistics” are of little interest to those interested in discourse analysis or CA.

There are also internal tracking tools that operate on the network servers that support these on-line forums. These tools are available as inexpensive Internet downloads, which may have as yet untapped potential for documenting on-line talk-in-interaction. The AXS tracking utility is available at <http://www.xav.com/scripts/axs>. The installation of this utility on a server may require some technical assistance to accommodate the Perl programming language. This AXS utility provides graphical and real-time log data analysis. Another free, open-source Internet data-gathering option that uses Active Server Page (ASP) programming and Access for the database function is available at <http://www.2enetworx.com/dev/projects/statcountex.asp>. Specifically, one can envision the need to document a student’s “hits” in a Web-based instructional unit that might be cross-referenced with on-line synchronous mentoring of a student who was exploring the information on that site. Again, although these kinds of on-line talk-in-interaction are not commonly used or researched, the potential for this type of conversation clearly exists. In fact, the entire area of on-line facilitation and

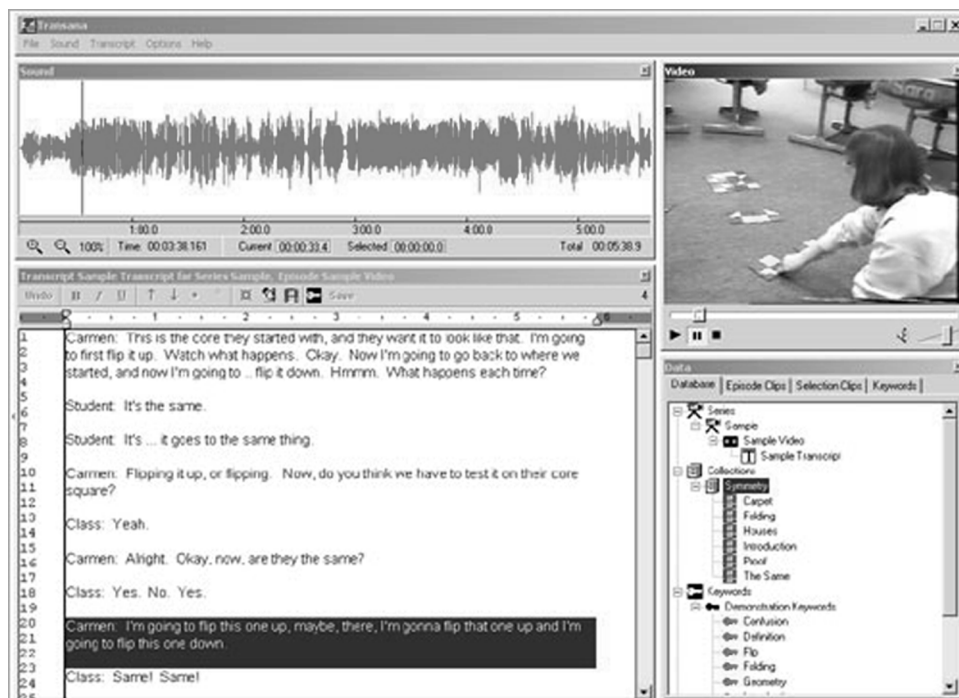


FIGURE 40.4. The main Transana screen showing multiple windows for displaying video, transcription, and database options.

so-called e-moderating has only recently received serious attention (Collison, Elbaum, Haavind, & Tinker, 2000; Salmon, 2000).

40.8.6 Screen Recorders of On-Screen Interactions

In complex, multimedia on-line environments it may be fruitful to consider the use of a “playback” screen recorder. In some ways this type of tool may be better suited to research that focuses on HCIs, but clearly the data produced—real-time visual archives of each click or mouse movement—may be required in multiple-mode conversational environments such as the use of Instant Messaging (which is not archived in the typical chat sense) in conjunction with digital video record of a desktop videoconference conversation. Hypercam is an excellent screen recorder tool for the PC that is available for about \$30 at <http://www.hyperionics.com>.

40.8.7 Additional Tools for Visualizing Conversation

Donath, Karahalios, and Viegas (1999) have noted insightfully that whereas archival text data of on-line conversations is searchable and highly useful in many respects, the text display is not particularly useful for depicting the inherent social patterns and relationships. These representational problems are exacerbated in graphical “microworld”-type environments available on the World Wide Web for chatting that use avatars to represent conversants. Two tools, Chat Circles, a graphical interface for synchronous conversation, and Loom, a visualization of threaded discussions (p. 2), have been developed for the purposes of investigating these underlying social patterns in these kinds of highly visual, graphically represented on-line conversation forums. The Chat Circle tool displays a “Conversation Landscape,” which is a two dimensional model that shows conversations as lines that become wider with the length of the message. Periods of silence are brought into sharp focus with this kind of conversation representation. Loom uses connected lines on a two-dimensional display to illustrate connections between postings. Various types of conversation groups (focused on narrow topics or free-for-all forums, for example) yield very different visual “gestalts” in their Loom display patterns, more intricate threading from user to user in the more open-ended forum.

By using Internet search engines many tools of these kinds can be found. Some are associated with quality control and performance improvement consulting companies, and the tools accompany those services. Others are available as freeware or shareware for purposes of documenting on-line interactions. The tools for researching conversation in on-line environments noted in this section mirror the many-faceted dimensions of on-line talk and interaction and reflect the diversity of the possibilities for inquiry into how, what, and why on-line talk has become such a part of daily life.

40.9 RESEARCH SYNTHESIS: HISTORICAL PERSPECTIVE AND FRAMES FOR THE ANALYSIS OF ON-LINE CONVERSATION FOR EDUCATIONAL TECHNOLOGISTS

In this section, I provide an historical overview and synthesis of salient research findings related to the foundational work on classroom talk and to research trends in CA as it is being applied to research on new modes of technology-involved conversation. This synthesis is intended to be illustrative of the research traditions in CA as they might be most applicable to the work of educational technologists interested in examining computer-mediated conversation. As a part of that task, I include several frameworks that have a research base and for which there seems to be much promise for developing a multifacet research agenda for investigating on-line talk-in-interaction. Several topics are presented in this section.

1. a brief historical overview that begins with salient work in classroom talk;
2. the interaction analysis model developed by an in-depth qualitative investigation of a global on-line debate, a pioneering effort to investigate such a networked conversation in light of social knowledge construction;
3. social network analysis, a framework borrowed from communication theory that has many potential applications to CMC conversation and interaction;
4. a typology of exchanges within a virtual community, a framework that addresses the conversational and communal aspects of on-line interaction; and, finally,
5. The social, linguistic, and interactional frames contained in the area of researching so-called *persistent conversation*—work that has integrated strategically interests from linguistics, social communication and learning, and CA—to investigate specifically how and why on-line conversations “persist” in the face of the many challenges that communicating in on-line environments poses.

40.9.1 A Brief Historical Overview

40.9.1.1 Building on Previous Work Investigating Classroom Talk. Although CA is clearly embedded in sociology and its elaboration in ethnomethodology, it is its application to educational contexts that concerns the efforts in this chapter. The appropriation of discourse analysis and CA techniques from sociology and linguistics in educational research began in the late 1960s and seemed to reach a zenith in the mid-1980s. Although it is my hope that research on on-line interaction will avoid the pitfall of superficial, inappropriate comparisons with “face-to-face” conversations (as often occurs, for example, between distance education and face-to-face learning), there is unquestionably a valuable history of examining classroom talk (Edwards & Westgate, 1987) that can inform our investigations of current

on-line conversation. In fact, some of the strongest evidence for the “teacher-centeredness” of classroom instruction was provided by the analysis of classroom interactions. In 1978 Mehan reported findings on a persistent, widely evidenced interaction pattern in classroom talk. The initiation–response–evaluation (I-R-E) model he induced through the use of a constant comparison technique is so prevalent that it can be identified in virtually all classrooms to this day. Constant comparison involves defining a typology based on evidence and discarding it only when a discrepant case is found. According to Mehan’s model, the instructor asks a question or poses a problem, the student responds, and the instructor then “evaluates” (often by repeating and intoning finality and correctness) the student’s response. Once aware of the I-R-E pattern one can easily see how the authority of the teacher’s talk (and ideas) is achieved as speech in action. If the “evaluation” response by the teacher is absent, students get the idea the response is faulty in some way. Carlsen (1990) provided a comprehensive review of questioning in classrooms in which he reviews research in terms of two prevalent paradigms focused on teacher–student interaction: the “process–product” paradigm and the “sociolinguistic” paradigm (p. 157). Within the process–product paradigm research findings focus on the relationship between discrete observable teacher practices and student outcomes. Using taxonomies of teacher behaviors, such as those developed by Flanders (1970), the effects of teacher action and talk on student outcomes are deduced. These actions can be experimentally manipulated and researchers in the process–product tradition seek to modify student outcomes by changing teacher behaviors. Within the sociolinguistic paradigm, the central beliefs are that classroom talk is context dependent and that contexts are constituted and modified by speakers in the course of conversation. Research in the sociolinguistic tradition of research has yielded insight into the context of questions, the content of questions and the responses, and participants’ reactions to questions. The epistemological differences in these two paradigms are apparent, and although each tradition has offered insight into classroom practices related to teacher action and talk, the sociolinguistic tradition of research on classroom talk is clearly more consonant with the perspectives on discourse analysis and CA described in this chapter.

40.9.1.2 Research on e-Mail and On-Line Networked Conferencing: Mid 1980s–Early 1990s. From the mid-1980s into the early 1990s there was a bubble of research activity in fields traditionally unrelated to education technology that sought to understand the emerging discourse patterns within the contexts of new communication technologies. The fields of sociology and linguistics continued to pursue CA in the context of the then-emerging on-line technology of choice, electronic mail. Journals such as *Discourse Processes*, *Written Communication*, *Human Society*, *Research on Language and Social Interaction*, *The American Journal of Sociology*, and *Studies in Social Interaction* were among the publications in which discourse analysis of e-mail appeared. Evidence began to accumulate that on-line forums might encourage broader and deeper participation in group activities (Kiesler, Siefel, & McGuire,

1984; Pullinger, 1986; Spitzer, 1989). CMC was seen to enable participation of handicapped students (Batson, 1988) and to encourage the participation of students often marginalized in face-to-face classroom settings such as women and minorities (Hiltz, 1986; Meeks, 1985). In 1991, Selfe and Meyer challenged some of those rosier assumptions in an exploratory study of the gender and power relationships that tested the claims of the so-called equalizing effects of anonymity in on-line forums used for student-centered collaborative writing. This work followed on the 1990 work by Cooper and Selfe related to evolving power relations in on-line contexts. These researchers found evidence that mutually constructed conversations formed normative discourse patterns of resistance related to authority roles in computer conferences. The October 1991 issue of *Written Communication* included research on the use of e-mail as a vehicle for peer response (Mabrito, 1991) that found that there were differences in conversation strategies of high- and low-apprehensive college writers in giving and accepting feedback about their writing. Sproul and Kessler (1988) reported on the problem of reduced social context cues as impediments to clear communication. Rice and Love (1987) examined socioemotional content in a computer mediated network. These researchers found that such content was essential to the engagement of participants and helped to establish “relationships” that played out in the both the content of the talk and the turn-taking conventions. Other researchers were focusing on how the affordances of on-line conferencing technologies were disrupting the usual temporal and spatial situations of face-to-face conversation (Black, Levin, Mehan, & Quinn, 1983).

Daly et al. (1987) developed a protocol analysis technique using accomplished typists as subjects. They used a think-aloud protocol to elicit subjects’ cognitions while the subjects used the text channel on a computer conferencing tool to converse. Using this admittedly flawed though inventive technique, these researchers were able to provide corroborating evidence for three general cognitive processes in conversation: inferencing, planning, and coping with maxim violations (p. 229). Maxims, as defined by Grice (1975), have to do with expectations between conversants related to contributions to conversation. The “quantity” maxim asserts that one should say enough but not too much, whereas the quality maxim relates to truthfulness. Research in this vein relates to cognitive models of discourse and conversation.

40.9.1.3 Revived Interest in Features of Electronic Discourse: The Late 1990s. For reasons that are unclear, after some years of waning interest, research activity in on-line or electronic discourse picked up in the late 1990s. Quite possibly the surge of participation in on-line communities that use both synchronous and asynchronous forums for purposes as diverse as Internet dating, professional development, and primary training for business and industry spurred researchers to focus again on these CMC contexts. Abdullah (1998) asserts that despite the fact that on-line conversation is written, it has nonetheless evolved to have a distinctly informal and conversational tone through the use of incomplete sentences, the use of lowercase letters to begin sentences, and uncorrected spelling.

These indiscretions, totally unacceptable in formal written communications, affect the casual immediacy of spoken interaction. Moreover, “readers” as listeners in these on-line conversations overlook the grammatical transgressions and focus on the emoticons and other cues, including the umms and errs embedded in the text as clues to the tone and import of various phrases (Davis & Brewer, 1997). A manual called *Wired Style: Principles of English Usage in the Digital Age* also signals the standardization of on-line text-talk conventions (Hale, 1996). A more serious question for education researchers is how to evaluate the extent to which postings to on-line discussions and chats represent evidence of students’ knowledge, reasoning, and understanding. The situational rhetoric on on-line conversation differs markedly from the erudite discourse of academia.

Issues of power, identity, and critical theoretical analysis have also resurfaced. Kolko (1998, 1999, 2000) has examined the use of linguistic patterns to represent identity discursively in on-line conversations. As more participants become entrenched in on-line forums and communities of discourse and rhetoric evolve, examinations of the extent to which on-line forums are sites for various aspects of social reproduction will become critical to our understanding of how conversation might be used mitigate those effects. Privacy and the balance of public and private space are also a concern as the tension between the containment of the individual and the coconstructed nature of self in community evolves.

40.9.2 Social Interaction and On-Line Community: New Frames for Conversation Analysis for the Twenty-first Century

As often occurs in educational research, some paradigms seem to recycle in somewhat modified forms as investigations of new contexts for learning are conducted. The context of the on-line community has begun to surface as a central notion in examinations of conversation and interaction in on-line forums. Of course language is central to a learning community to support negotiation and collaboration among peers. Information sharing through conversation and dialogic interaction is endemic to the functions of a learning community (John-Steiner & Mahn, 1996). Interestingly, research in the traditions of both the process-product paradigm and the sociolinguistic paradigms articulated by Carlsen (1991) seem to be in evidence as this current body of research accumulates. However, in the process-product vein, rather than focusing on how teacher behaviors might change outcomes within classroom interactions, the focus is on how self-directed behavior or group behavior might change learning outcomes or perceptions of outcomes. In their article “Socio-cognitive Constructs and Characteristics of Classroom Communities: An Exploration of Relationships,” Gallini and Zhang (1997) conclude that factors such as “preferences to work independently” and “preferences to work in groups” constituted a “task structure” variable. Presumably manipulation of this variable would affect outcomes for these students. These variables are predetermined and can be experimentally manipulated using quasi-experimental methods. Although the authors

conclude that “through e-mail, students become immersed in the discourse structures of inquiry, conjecture, evidence and proof (p. 336)”, their methods include no conversation analysis to support this claim. A sociolinguistic approach would have utilized more inferential methods and CA to examine how the e-mail transcriptions of talk-in-interaction achieved these constructivist learning outcomes.

More consonant with the sociolinguistic paradigm, several frameworks have been used recently to analyze on-line interaction and talk in on-line networked environments.

40.9.2.1 An Interaction Analysis Model for the Examination of Social Knowledge Construction. Gunawardena, Lowe, and Anderson (1997) developed their pioneering *interaction analysis model* to address lacunae in the research on participant interaction in on-line forums. Despite the technical capacity to log and tabulate more superficial aspects of participation, such as who participates or the duration and pattern of on-line activity, such research does not address the quality of the interaction. Information about how or if learning or knowledge constructions (or coconstructions in the case of on-line talk) occurred or insights into how such learning or knowledge construction may be supported or hampered was unavailable. Such analyses can be achieved only through careful attention to the content of the particular on-line interactions. By asserting this problem, Gunawardena and her colleagues encountered another lack: the paucity of analytic frameworks through which to examine the quality of on-line interaction.

An analysis of the content of messages exchanged during a week-long, global on-line “debate” with 554 list subscribers was conducted as part of preconference activities for the 1995 XVI World Conference of the International Council on Distance Education. The researchers developed an interaction analysis model based on the content of the on-line talk in this debate forum for the specific purpose of understanding the processes of negotiating meaning and coconstruction of knowledge in a collaborative learning environment. Prior to elaborating their interaction analysis model, they are careful to articulate the local circumstances and context of the data source. First, the participants were participants in a distance-education conference, and the topic was a controversial one, proposed as a purposely reduced statement, “No Interaction, No Debate,” to fuel partisan participation. Second, although participants were free to choose whether to participate on the affirmative or negative side of the question, the debate had rules that circumscribed the general content of postings during the week-long event. For example, on day 1 the first affirmative was posted by the team leader and arguments in favor of the proposition had to be posted within that 24-hr period. The “team leader” was tasked with summarizing the day’s postings on the affirmative side. This organizational scheme was applied throughout the week, alternating elements typical of general debate formats, first negative, affirmative rebuttal, and so forth. Consequent to the formalizing functions of this debate format, many of the social dimensions that might be evident in a more loosely structured forum were not in evidence in the on-line talk of these participants.

Using the naturally occurring talk of the debaters, the researchers used the transcripts of the debate and developed the

framework in several stages. First, they critically reviewed currently available interaction models and definitions of interaction and interaction analysis. Next, these models were tested on the debate transcript and a new model was developed based on deficiencies seen as part of that exercise. Finally, a new interaction analysis model was developed and then applied to an inductive analysis of themes, patterns, and phases evident in the debate transcript.

The interaction analysis model has five phases related to social knowledge construction in computer conferencing. Each phase is comprised of several operations that can be used to analyze the content of talk-in-interaction. For each phase listed, illustrative operations, rather than complete lists, are noted

Phase I: Sharing/comparison of information. Within this phase operations include (a) a statement of observation or opinion and (b) a statement of agreement from one or more other participants.

Phase II: Discovery and exploration of dissonance or inconsistency among ideas, concepts, or statements. Within this phase operations include (a) identifying and stating areas of disagreement and (b) asking and answering questions to clarify the source and extent of disagreement.

Phase III: Negotiation of meaning/coconstruction of knowledge. Within this phase operations include (a) negotiation or clarification of the meaning of terms and (b) negotiation of the relative weight to be assigned to types of argument.

Phase IV: Testing and modification of proposed synthesis or coconstruction. Within this phase operations include (a) testing the proposed synthesis against “received fact” as shared by participants and/or their culture and (b) testing against existing cognitive schema.

Phase V: Agreement statement(s)/application of newly constructed meaning. Within this phase operations include (a) summarization of agreement and (b) applications of new knowledge.

Gunawardena and her colleagues have added to the discourse on the analysis of on-line talk by adopting the more inclusive definition of interaction as

the totality of interconnected and mutually-responsive messages which make up the conference, and perhaps more: ‘interaction’ is the entire gestalt formed by the on-line communication among the participants. . . the process observed in the debate is akin to Salomon’s (1993) thinking on “distributed cognitions” where he states individual and “distributed cognitions” interact over time, affecting each other and developing from each other. (p. 407)

These researchers caution against using more fine-grained and detailed analyses of “threaded” language forms and turn-taking (such as the methods described in the preceding sections), which have the potential of losing site of the big picture—losing the forest in the trees, so to speak. They believe that their approach is more useful for understanding the ongoing processes of talk-in-interaction as an ongoing process of knowledge construction rather than threads of conversation that may open or close, knowledge of which does not particularly lead to rich understandings of the interactional activity.

Of course, this position can be countered with attention to the sociological roots of conversation analysis and the hopes that, by understanding naturally occurring talk, we can understand the larger processes, social and cognitive, that are in evidence in on-line talk. Gunawardena and her colleagues point to the phenomenon of a conference that has run its course or “threads” that seem to “dry up” (p. 428). From the perspective of CA, the possibilities to examine the power relationships inherent in the talk, for example, may give clues to the function (or lack thereof) of the forum for the participants. Perhaps threads dry up because participants are cued not to explore “offensive” topics further. Or perhaps, in a more positive vein, they simply have no more to say and closure in turns indicates satisfaction, not dissatisfaction, with the interaction. Quite possibly a combination of CA methods and the interaction analysis model approach might provide triangulation data for research assertions.

40.9.2.2 Social Network Analysis. Incorporating the levels of interaction from the Gunawardena et al. (1997) model and social network analysis (SNA; Scott, 1991; Wasserman and Faust, 1997), deLaat (2001) analyzed the interaction patterns of an on-line community of practice within a Dutch police organization. The purpose of the analysis was to ascertain how active the participants were and in the discourse, who the central participants were, and how dense the participation was within the network and to examine the quality of the discourse. SNA was conducted by aggregating the total number of messages sent (as taken from server logs) and detailing the various recipients as “nodes” in the network. When closely examined the researcher discovered that many messages were initiations to which no replies were posted. However, in rechecking the data, deLaat found that some messages that were apparently new messages were in fact “latched” to previous threads. This research indicates how conversation analysis provides the fine-grained tools to examine closely the actual discursive interactions, rather than relying on grosser indicators such as “messages sent.” However, the use of the SNA did empirically identify and display the range of interaction within the community. To assess the quality of the discourse, the 233 messages in deLaat’s study were coded using the Gunawardena et al. scheme.

40.9.2.3 A Typology of Exchanges Within a Virtual Community. Another approach to the examination of interaction has been developed by Burnett (2002). At first glance this approach appears to draw on the tradition of discourse as cognition and takes a view of interaction as “information seeking,” and Burnett denotes information exchange as the phenomenon of interest in a virtual community. However, the typology developed is based conceptually on Savolainen’s (1995) research of nonwork, everyday life information seeking as “a natural component of everyday practices (p. 261; quoted in Burnett, 2002, p. 3). The typology focuses on the *behaviors* of participants as they interact, often within the dislocations of time and space inherent in on-line talk and interaction. The typology with summary explanations is reported here.

40.9.2.3.1 Noninteractive Behaviors. The noninteractive behavior category is interesting because it provides a framework

for examining participation that seemingly does not exist. Specifically this category refers to the activities of participants who do not type in talk but are actively following along as reader/listeners in the discussion. This activity, often termed *lurking* in on-line forums, might be elaborated to include a more positive term with less voyeuristic connotations, *listeners*, for example. Still, these nonparticipants have been shown to be a large portion of on-line users. Smith (1992) reported that 50% of all messages were written by only 1% of those logged on. By including this category in his typology, Burnett focuses our attention on a significant, though hard to examine, constituency in on-line interaction.

40.9.2.3.2 Interactive Behaviors. The interactive behavior category encompasses the range of posting or active message writing that constitutes the talk-in-interaction of on-line CMC. Interactive behaviors are further broken down into hostile and collaborative/positive behaviors.

A. Hostile Behaviors: Hostile behaviors are comprised of on-line behaviors that are impolite, uncivil, or outright antisocial in character. Flaming is on-line argumentation usually characterized by large amounts of CAPITALIZED TEXT and emoticons as well as inappropriate or disrespectful language such as the use of racial slurs or profanity. Trolling, the term for deliberate postings of inflammatory or provocative messages, is often used as a form of “initiation” right within the on-line community. Newcomers (termed *newbies*) may be prompted to post corrective, though naïve responses and thus draw the disdainful comments of more seasoned community members. Spamming, the on-line equivalent of junk mail or excessive verbiage, is usually unsolicited and therefore distracting and annoying to participants. Cyber-rape, explicit sexual verbal assaults directed personally at specific participants, is a particularly vicious form of hostile behavior. Among the most well-known cases is perhaps the incident that occurred on LambdaMOO, where a participant was verbally gang-raped by a group of anonymous assailants (Dibbell, 1998). Some argue that the instances of name-calling, hate speech, and other hostile behaviors mirror those in face-to-face interactions, and such behaviors are rooted in personal orientation, rather than communication media. On the other hand, it is plausible to make the case that the anonymity afforded participants is surely related to some users’ temerity in expressing hostile behavior through on-line talk.

B. Collaborative Interactive Behaviors: Clearly, the overarching purposes of message exchange are generally positive ones. Collaborative interactive behaviors are further divided into (1) behaviors not specifically oriented toward information and (2) behaviors directly related to either information seeking or providing information to other community members.

(1) Behaviors not specifically oriented toward information include neutral behaviors such as pleasantries and gossip, humorous behaviors, and empathic behaviors that offer emotional or moral support.

(2) Behaviors directly related to either information seeking or providing information to other community members include announcements, queries or specific requests for information (made by community members or participants outside the

community or queries presented directly to the community), and group-directed projects.

Taxonomic approaches such as the one taken by Burnett can seem to impose an overly restrictive structure on naturally occurring on-line talk. However, the possibilities to use the techniques and analysis frames from CA as it can be applied within this typology are rich areas for further research. A key element in this typology is the emphasis on the on-line message content and exchange as “behavior” harkening back to the speech act theory roots of CA.

40.9.3 Persistent Conversation

Given that humans are social creatures bent on communicating regardless of the barriers, it should not be surprising that despite the difficulties in achieving contact, coherence, and interaction, conversation using digital, on-line technologies has persisted (Erickson, 1999). No one disputes that CMC differs from the face-to-face experience (Walther, 1996). However, as “persistent conversations” continue in a variety of on-line environments, researchers investigating the ubiquitous phenomenon of on-line talk have begun to integrate the linguistic, social, and moral traditions from which conversation analysis evolved.

Susan Herring (1996) has been a pioneer in investigations of how, despite the purported incoherence of on-line conversation, participants in either asynchronous or synchronous forums have established conventions that reclaim the coherence and personality of conversational interaction. To counter the lacks in simultaneous feedback and disruptions in turn adjacencies, this linguist and others (Cherney, 1999; Condon and Cech, 1996) assert that conversants have adapted to affordances in the medium and normative elements of on-line conversation in evidence. Herring’s (1999) research shows consistent evidence for several normative elements: (a) backchannels are minimal postturn responses such as “nods,” “giggles,” and (?) questioning looks (Cherney, 1999, p. 186); (b) turn change signals are agreed-on cues that denote that one is (or is not) ready to cede the floor; (c) cross-turn references are used especially in multiuser synchronous environments that begin the posting with the user name or the intended recipient, a convention Werry (1996) terms *addressivity*; and (d) topical organization, particularly in asynchronous environments, is achieved through the familiar practice of threading discussions using topical outline formatting to promote coherence in on-line talk. The success of this strategy is a straightforward demonstration of the need to employ elements of the technology of text (Jonassen, 1982) in designing conversational environments. The archiving functions of text-based chat and discussion forums also contribute to the quite literal persistence of conversation in the legacy of an archive of the on-line talk. The archive is a vehicle for so-called lurkers and nonconversants to participate as “readers” of the conversation. This kind of involvement is not trivial and nonconversants can actually feel a part of a conversation in which they have not spoken a word (Mazur, David, Kanappel, & Coe, 2002).

Language is inherent in community and several researchers have refocused efforts along the sociolinguistic dimension (Paolillo, 1999). The effects of how users in CMC environments

adapt, reshape, and use new linguistic conventions to retain elements of social interaction are the focus of this work. Through the use of language, “tie strength” and “connections” among participants are in evidence. Although language is clearly a factor in social connection, Paolillo’s work has shown that there exists a “more complex arrangement of linguistic variables” that support shared discourse and tie strength in evolving virtual speech communities. How these kinds of ties relate to the capacities for on-line conversation to be used for instruction, learning, and knowledge is as yet uncharted water.

The notion of community has proved to be an enduring one in understanding persistent conversation in cyberspace (Rheingold, 1993). Work has begun to appear examining virtual discourse and networking in the formulation of professional communities (Davis, 1998; Mavis & Brocato, 1998) and communities organized around mutual interest (Carroll & Rosson, 1996) and for a myriad of formal and informal purposes (Isaacs, Tang, & Morris, 1996; Rosson, 1999; Whittaker, 1996). One certainty exists. As computer-mediated conversation persists, so too must research efforts in order to understand the complex interactions among technological affordances, linguistic and sociolinguistic communication, and social learning efforts.

40.10 DIRECTIONS FOR FUTURE RESEARCH: PROMISES AND PROBLEMS OF THE CA APPROACH

Increasingly, the use of CMC for training, instruction, continuing education, and professional development involves conversation and on-line discourse in varying degrees of formal and informal interaction. As on-line talk in its many forms proliferates, the use

of CA techniques may be useful to inform the design and evaluation of instruction. For CA to be useful in these tasks, much work needs to be done regarding our understanding of the contexts, content, participant response and reaction, and the social relationships inherent in all this on-line talk-in-interaction. Echoing Mason (1991), I challenge researchers interested in on-line learning and the social dimensions of knowledge, cognition, and instruction to take on the task of in-depth examinations of the content, structures, processes, and meaning of on-line conversation and talk-in-interaction, arduous and time-consuming though it might be. Such investigations can only enhance our understanding of how best to use and design educational experiences for this seemingly ubiquitous communication context.

There are new technology tools for accumulating data for CA. However, new transcription conventions and how best to use these tools to support sophisticated and thoughtful analyses are as yet untapped.

Perhaps the most productive avenue to further research on talk in the naturally occurring settings of these burgeoning on-line communities would be to propose a larger frame of discourse analysis and, within that frame, examine the many aspects of interaction, conversation, and behavior, as they might further inform us on the experiences of participants as they use talk-in-interaction as the primary vehicle for information sharing, knowledge construction, and the development of social relationships that are inherent in all educational endeavors.

ACKNOWLEDGMENTS

I wish to thank David Jonassen and Barb Bischelmeyer for feedback, questions, and comments that improved the content of this chapter and helped clarify my thinking.

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