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Conversation Analysis and Collaborative Learning

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ABSTRACT

Conversation Analysis (CA) research examines the organization of talk-in-interaction. Since, talk-in-interaction is central to virtually all kinds of instruction, one might expect that the CA literature might contribute in important ways to our understanding of how instruction in settings of collaboration is organized. The chapter focuses on three early CA articles illustrating how the constructs they introduced can be applied to the task of describing a fragment of recorded interaction. It will then be illustrated how these constructs relate to research on instruction. The essay concludes by explaining how research on interaction can be tied to understanding.

The current volume is dedicated to gathering and summarizing research extant on Collaborative Learning (CL). For the purposes of the discussion that follows, we shall take CL to represent a broad class of pedagogical methods that involve engaging learners in variety of instructional activities (e.g. small group discussions, team projects, etc.) carried out collaboratively. It is often presented as an alternative to more traditional methods of didactic instruction (see, for example, Koschmann, Kelson, Feltovich, & Barrows, 1996). Conversation Analysis (CA) involves research into the organization of talk-in-interaction. Since, talk-in-interaction plays a crucial and indisputable role in the enactment of all kinds of instruction, it might seem reasonable to expect that the large literature on CA might in some way be able to inform understandings of how interaction is organized in instructional settings including those in which CL-based methods are being employed. The purpose of this chapter, therefore, is to work out these fruitful points of contact between CA and research on CL.

As will be argued later, CA offers a new way of studying understanding as it is produced in interaction. Indeed, it offers a new way of understanding understanding itself (Koschmann, 2011). To see how this is so we need to characterize what distinguishes CA research from other ways of studying interaction and review some of its important findings. The list of studies comprising the CA literature is a long one, however, and numbers in the thousands. To help make this discussion manageable, we

will focus on three articles published early on in the development of the field, articles that came to serve as cornerstones for that literature. I will provide a brief synopsis of each of these articles and illustrate how the constructs they introduced can be applied to the task of describing a fragment of recorded interaction. I will then explain how these constructs relate to research on the organization of instruction generally and, more specifically to research on instruction in settings of collaboration. The essay concludes by explaining how research on interactional organizations relates to understanding. Before launching into this exposition, however, let us begin by examining some of the essential features of CA research.

CA METHODOLOGY

The sociologist Harvey Sacks is generally credited with establishing CA as an area of inquiry (Silverman, 1998). He did so in a series of lectures delivered in the late '60s and early '70s (Sacks, 1992). Sacks' approach to studying talk-in-interaction found its roots in ethnomethodology, a school within sociology that focuses on the ways in which members of society produce their everyday world as sensible. As a program of study, ethnomethodology assigns "exclusive priority to the study of the methods of concerted actions and methods of common understanding" (Garfinkel, 1967, p. 31). As Garfinkel clarifies, it is a plurality of such methods: "Not *a* method of understanding, but immensely various methods of understanding are the professional sociologist's proper and hitherto unstudied and critical phenomena" (p. 31). CA focuses on the methods whereby speakers and hearers collaboratively produce sense within talk-in-interaction.

Sacks' procedure for studying conversation was a designedly austere one. He began working with recorded telephone conversations. As he described:

> I started to play around with tape-recorded conversations for the single virtue that I could replay them; that I could type them out somewhat, and study them extendedly, who knew how long it might take. And that was a good record of what happened, to some extent. Other things, to be sure, happened, but at least that [what was on the tape] had happened. (LC1: 622).[1]

In addition to being convenient to work with, recordings make it possible for others to evaluate the adequacy of an analysis. Sacks recounted, "others could look at what I had studied, and make of it what they could, if they wanted to be able to disagree with me" (LC1: 622). Now days, video recordings are the analytic materials of choice. Because of this, research on conversation is no longer restricted to simple vocal productions, but

has been expanded to include a broader repertoire of communicative behaviors including gesture, gaze, posture, etc. (Streek, Goodwin, & LeBaron, 2011).

Recordings are cataloged and transcriptions are prepared for selected fragments. Our understanding of how an utterance is to be construed is often shaped by various aspects of its delivery. CA transcripts capture not only what is said, but also details of delivery (intonation, volume, pace) and timing. By including these features in the transcript, they are made available to the analysis and, later, serve as a means whereby others can reconstruct the practices upon which the analysis was based. Gail Jefferson developed a conventionalized notation system for representing these details.[2] Transcripts utilizing Jefferson's conventions have become emblematic of conversation analytic work.

Sacks advocated a form of "unmotivated examination" of one's data. He (1984) suggested, "Treating some actual conversation in an unmotivated way, that is, giving some consideration to whatever can be found in any particular conversation we happen to have our hands on, subjecting it to investigation in any direction that can be produced from it, can have strong payoffs" (p. 27). Rather than approaching a set of materials with particular questions in mind (e.g., Is this good teaching? Are these students learning?), Sacks favored an approach that set such concerns aside and instead asked, what are they doing and exactly how are they doing it?[3]

Schegloff and Sacks (1973) observed, "A pervasively relevant issue (for participants) about utterances in conversation is 'why that now'" (p. 299)? It turns out to be an important question for conversation analysts as well. The goal of CA is "to explicate the ways in which the materials are produced by members in orderly ways that exhibit their orderliness, have their orderliness appreciated and used, and have that appreciation displayed and treated as the basis for subsequent action" (Schegloff & Sacks, 1973, p. 290). Through this organization, participants' understandings are made available to the conversation analyst for detailed study:

> But while understandings of other turns' talk are displayed to co-participants, they are available as well to professional analysts, who are thereby afforded a proof criterion (and a search procedure) for the analysis of what a turn's talk is occupied with. Since it is parties' understandings of prior turns' talk that is relevant to their construction of next turns, it is THEIR understandings that are wanted for analysis. The display of those understandings in the talk of subsequent turns affords both a resource for the analysis of prior turns and a proof procedure for professional analyses of prior turns—resources intrinsic to the data themselves. (Sacks, Schegloff, & Jefferson, 1974, p. 729)

The method of CA, therefore, is to conduct an analysis into participants' everyday analyses—the witnessible procedures whereby they produce their interaction as sensible. The goal of the technical analysis is to produce an account of how understanding is achieved within the participants' talk, not through speculation about causes and effects, but rather by simply describing just how it was done based on what is available to be seen and heard in the recording. This insistence that all claims must be grounded in the recorded materials is a hallmark of CA research and a source of its rigor. The participants' joint production of understanding is fundamental to how instructional and collaborative interaction is organized. This is an important point to which we will return a bit later.

THREE KEY CA FINDINGS

We will now turn to some basic findings in the CA literature. The matters to be taken up here—turn and sequence construction and repair organization—were first introduced in Sacks' lectures, but were more thoroughly described in three later papers. Our exploration of these topics, therefore, will entail re-visiting these classic reports. As we shall see, the three constructs speak to participant understanding in different ways. They will provide us with a vocabulary for discussing the organization of instructional and collaborative interaction.

The Turn-Taking System

Sacks (unpub. ms.) noted, "In a single conversation at least one and not more than one party talks at a time." This stunningly simple observation raises a host of puzzling questions, however. How is it, for example, that there are rarely long unfilled gaps in conversation and that speakers just as rarely speak in overlap? The speaker's audience analyzes a turn-in-progress listening for the place where a transition to a new speaker *might* be relevant. Sacks, Schegloff and Jefferson (1974) proposed a model which they termed the "simplest systematics" to explain how this is done. The model had two parts: the Turn-Constructional Component and the Turn-Allocation Component. The first is definitional and describes how a turn at talk is put together. By their terms, a turn at talk is built up from one or more Turn Constructional Units (TCUs). A TCU might consist of a

grammatically correct sentence, but could also be a clause, phrase, or even a single term. To determine the boundaries of a TCU involves detecting the places in a developing turn where a transfer of speakership might be appropriate. Sacks et al. refer to such positions as a "Transition-Relevance Place" (TRP). The listener's (and the analyst's) task is one of projecting when the next TRP might arrive. Grammar may play some role in this, but timing and intonation (and probably other factors) are also important (Ford, Fox, & Thompson, 1996).

<<Insert Figure 1 about here>>

The Turn-Allocation Component is algorithmic and describes the analysis that occurs when a TRP is reached as summarized in Figure 1. Note that the rules are applied in serial fashion. If the conditions specified in 1(a) or 1(b) are not met, the current turn continues and Rule 1 is reapplied recursively. As Sacks et al. make clear, the operation of the model is locally-managed, contingent and interactional: "the turn is a unit whose constitution and boundaries involve such a distribution of tasks as we have noted: that a speaker can talk in such a way as to permit projection of possible completion to be made from his talk, from its start, allowing others to use its transition places to start talk, to pass up talk, to affect directions of talk etc.; and that their starting to talk, if properly placed, can determine where he ought to stop talk." (p. 727). [4]

The 'simplest systematics' model has important implications for participant understanding. Sacks et al. (1974) observe that (1) it obliges a special form of listening, (2) that entailed in this listening is a recognition of the type of action that the preceding turn performs, and (3) that the enactment of this model serves as a demonstration of understanding or "proof procedure" (p. 728). They note further that turns at talk are constructed in ways that mark their connection to the turns that immediately proceed and follow. This leads naturally, to the next important development, sequence construction.

Adjacency Pairs and Sequence Construction

Pairs of adjacently positioned turns were taken up by Sacks as the central topic of his last set of published lectures, those of the spring semester of 1972 (LC2: 521-575). The analysis of sequences has assumed central importance in contemporary CA studies and adjacency pairs are both the simplest possible sequence and an organizing unit in longer sequences. As Schegloff (2006) described, "the adjacency pair is the prime

resource in conversation for getting something to happen, because it provides a determinate *place* for it to happen—next" (p. 264). Adjacency pairs were taken up in an early paper that became another CA classic.

In "Opening Up Closings," Schegloff and Sacks (1973) introduced adjacency pairs as a means of explaining how conversations are brought to an end. The "simplest systematics" paper (Sacks et al., 1974) described an algorithm for speakership transition that was non-terminating. One of many uses of adjacency pairs in conversation is to produce a "terminal exchange" (e.g., "Bye.", "Good bye."). Adjacency pairs consist of two coupled utterances, commonly termed the first pair-part (FPP) and the second pair-part (SPP). The occurrence of an FPP makes relevant an appropriately fitted SPP. The adjacency pair represents the smallest possible sequence. Simple base pairs can be elaborated through various forms of pre-, insert-, and post-expansion (Schegloff, 2006). In addition to elaborated adjacency pairs there are other kinds of sequences with a basic architecture involving three or more turns. We will see some examples of these shortly.

Like the turn-taking model described earlier, sequences are implicated in understanding:

> What two utterances produced by different speakers can do that one utterance cannot do is: by an adjacently positioned second, a speaker can show that he understood what a prior aimed at, and that he is willing to go along with that. Also, by virtue of the occurrence of an adjacently produced second, the doer of a first can see that what he intended was indeed understood, and that it was or was not accepted. Also, of course, a second can assert his failure to understand, or disagreement, and inspection of a second by a first can allow the first speaker to see that while the second thought he understood, indeed he misunderstood. It is then through the use of adjacent positioning that appreciations, failures, corrections, etcetera can be themselves understandably attempted. (Schegloff & Sacks, 1973, p. 298).

These potential misunderstandings and corrections bring us to a third foundational area of inquiry in CA, namely the organization of conversational repair.

The Organization of Repair

Sacks et al. (1974) noted that, "the various organizations operative in conversation are susceptible to errors, violations, and troubles" (p. 723). Repair sequences serve as "a self-righting mechanism built in as an integral part of the organization of talk-in-interaction" (Schegloff, 1992, p. 1299). A summarization of how these sequences are organized was provided in a third paper, Schegloff, Jefferson and Sacks (1977). The

authors label the matter that stands in need of repair as the *repair target* or the *repairable*. A distinction is made between repair initiation, how the repair process is begun, and the repair itself. Repair sequences can take a variety of forms. In the simplest case, the repair target and its repair are located within the same turn. An example would be what we might colloquially term a 'mis-speaking' in which the speaker interrupts a turn in progress to restate or repair some portion of that turn. Schegloff et al. described two two-turn repair sequence types—repairs produced by the original speaker ("self-repair" in the TRP) and repairs produced by the listener ("other-repair" in the next turn). Subsequent research has predominately focused on the latter. Three-turn sequences are seen when the listener initiates repair ("next turn repair initiation") and the original speaker then addresses the problem in the subsequent turn.[5] In all cases we can see that the work of repair is generally done in close proximity to the trouble source.

The authors observe that there is a marked 'preference' for self-repair in a three-turn repair sequence over other-repair in a two-turn repair sequence. The notion of preference in CA is frequently misunderstood. It does not denote someone's partiality for one practice over another, but rather is an organizing feature of how talk is produced.[6] With regard to repair, we might say our methods of overcoming misunderstandings are built to favor correction by the first speaker. Schegloff et al. (1977) cite the following lines of evidence: when repairs are self-initiated, they are always self-repaired; when repairs are other-initiated, they are still "overwhelmingly" self-repaired; "other-initiations occur after a slight gap, the gap evidencing a withhold beyond the completion of the trouble-source turn—providing an 'extra' opportunity, in an expanded transition space, for speaker of trouble source to self-initiate repair" (p. 374); when other-repair does occur it is done in a "modulated" fashion (e.g., delivered with uncertainty markers, produced as a question, presented ironically); finally, when other-repairs appear, it is often preliminary to a disagreement.

It should be noted that the organization of repair is tightly integrated with the previously described mechanisms for turn construction and sequence design. In the 'simplest systematics' paper, Sacks et al. wrote about the relation between turn-taking and repair:

> The compatibility of the model of turn-taking with the facts of repair is thus of a dual character: the turn-taking system lends itself to, and incorporates devices for, repair of its troubles; and the turn-taking system is a basic organizational device for the repair of any other troubles in conversation. The turn-taking system and the organization of repair are thus 'made for each other' in a double sense. (p. 724)

Not surprisingly, repair plays an important role in the ways that understanding is negotiated and maintained in talk. In most situations where it is clear to speakers and listeners what would count as an appropriate next turn, they carry on by simply producing that turn. As Schegloff (1992) observed, "[U]nderstandings are displayed en passant for the most part … as by-products of bits of talk designed in the first instance to do some action such as agreeing, answering, assessing, responding, requesting, and so on" (p. 1300). It is only when it is not clear how to go on that the need for conversational repair arises.

ANALYZING A SEQUENCE OF TALK-IN-INTERACTION

Let us now look at how the constructs introduced in the three described articles (Sacks et al., 1974; Schegloff & Sacks, 1973; and Schegloff et al., 1977) can be employed to reveal the structure of a fragment of talk. The data presented in Exhibit 1 were previously published in Roschelle (1992). Roschelle's study is a classic example of a practice-based investigation of a CL-based activity. He described how two students, Carol and Dana, worked together at a computer conducting experiments in basic mechanics using a computer program.[7]

<<Insert Exhibit 1 about here>>

The transcript employs the notational conventions developed by Jefferson (2004). The excerpt begins with an utterance produced by Dana (lines 1-3). Features of her delivery and timing are captured in the transcript. Note, for example, the word *how* (line 1) includes two colons indicating that the vowel sound was prolonged. The period enclosed in parentheses following *how* indicates that a micropause (<.2 s.) was heard there. The text at the beginning of the next line is enclosed in parentheses indicating that the transcriber was unsure how to transcribe the talk. Two possible hearings are suggested. The letters O and W in *arrow* in line 3 are underscored indicating that that syllable was stressed. At the end of line 3 we find a number enclosed in parentheses. This represents a timed pause, expressed to the nearest tenth of a second.

Dana prefaces her turn with "What I don't understand is." She continues with "ho::w the length thing" (or possibly "the lengthening"), but pauses and restarts. Restarting with

"the", she thereby retains the rest of the beginning of the utterance as spoken. In this way, she corrects herself to produce something that could be heard as "What I don't understand is how---the positioning of that arrow." "Arrow" is not produced with the falling intonation of a completed sentence, nor is it given the rising intonation of a question. This might project something more to come, but instead a long pause follows.[8] Lindwall and Lymer (2011) report that declarations of a failure to understand are often treated as requests for explanation. It operates as a first pair-part, making relevant some sort of response related to the matter raised.

After Dana's prolonged pause, Carol self-selects to produce the next turn. Her extended turn (lines 6-11) is heard as a second-pair part to Dana's request for an explanation. The 'H's preceded by a period and enclosed in parentheses indicate a possible audible in-breath at the beginning of line 4. The inverted question mark after *is* indicates a partial upward shift in intonation with the delivery of that word. "Y'know what I think it is" takes the grammatical form of a question. The equal sign preceding *it's,* however, indicates that there was no hearable pause between the two words leaving no place for Dana to respond. Carol produces a gesture described in lines 12-13 and concurrent with the enunciation of "line" in line 7. Note how this coordination of talk and gesture is represented in the transcript. She produces three additional gestures (lines 14-19) over the course of her turn.

Koshik (2005) has argued that so-called 'rhetorical' questions, rather than seeking information, often serve to inform. As Schegloff (2006) explained, the making of an announcement is often preceded by a "pre-telling" or a "pre-announcement." He notes that such actions "serve as an alert to recipients that what is to follow is built to be an informing" and also "may give evidence of the recency of what is to be reported" (p. 3). This is how we hear Carol's question in line 6. Carol's long turn is a complex one involving stops, restarts, and repeats. She begins her account with "It's like the lines", but then stops, produces a micropause, and then restarts with a word we find hard to hear, saying either "that arrow" or "fat arrow."

The pronoun *it* appears recurrently in her developing account ending with the marvelously succinct, "It pulls it." Sacks described various 'tying rules' for linking utterances together. One had to do with the use of proterms like *it*. He wrote, "To decide what it is that the tied turn term—for example, 'it'—refers to, requires finding somewhere in the conversation that the term it ties to occurs" (LC1: 163). Here we find a succession of statements tied using the mechanism described by Sacks. We hear the

first two ("y'know what *it* is", "*it*'s like the line") as referring back to the problem enunciated by Dana ("the positioning of that arrow"). The use of the pronoun in this way does the work of tying Carol's offered account back to Dana's request for an explanation. The latter two instances ("*it* pulls that down", "*It* pulls it"), on the other hand, constitute the account itself. Both employ the transitive verb *pulls*. The challenge for the listener (and analysts) is to determine what is serving as the verb's subject and object. Roschelle (1992) describes how some of this ambiguity is resolved through Carol's embodied actions. They are examples of what Goodwin (2007) described as "environmentally-coupled" gestures. They are precisely coordinated with her talk (see Hindmarsh & Heath, 2000) and with events unfolding on the computer screen. Despite the availability of these visual resources, however, additional work was needed to unpack Carol's account.

Treating Carol's just delivered account as a potential source of trouble, Dana produces a query (line 21) that initiates a repair of understanding. It seeks confirmation of the referent of "black arrow" and makes relevant some sort of agreement from Carol. It is an example of what we have been describing as self-repair in a three-turn repair sequence or what Schegloff (1992) discusses as a "Next Turn Repair Initiation (NTRI)". Relative to the sequence still in progress, Dana's repair initiation is a "post-second expansion" (Schegloff, 2006) on the base adjacency pair.

Following Carol's response (line 25), Dana advances a candidate understanding of Carol's explanation (line 26), thereby making relevant another sign of agreement from Carol. The candidate understanding is tied to the previous repair sequence, both by its use of the pronoun *it*, referring to the black arrow, and its "*and*-prefacing" (Heritage & Sorjonen, 1994). It is another post-expansion of the base adjacency pair. Instead of waiting for Dana to complete her formulation and then ratifying it, however, Carol does something else. She starts a turn in overlap with Dana (line 30), co-producing the tail of Dana's as yet uncompleted utterance. Completing someone else's utterance, either for them or with them, is a very persuasive way of showing that you understand what they are saying.[9]

By tying the phrase "on its hinge" to their jointly-produced formulation, Carol and Dana, have moved beyond just clarifying what "It pulls it" might mean to extending it in certain ways. The appended phrase speaks to how the pulling is enacted. Having initiated a repair in line 21 and receiving ratification, one might expect to hear a "sequence-closing-third" (Schegloff, 2006, p. 118) at line 32. Instead we find silence. In

lieu of any sort of uptake, Carol, therefore, restates the collaboratively-constructed explanation (lines 33-34), adding an additional descriptive phrase ("down to the tip of the black arrow"). "Arrow", however, is not produced with the falling intonation usually found at the completion of a sentence. This suggests that there might be more of her turn to come, but instead a long pause follows. Dana completes the account-in-progress with the clause, "making the line that you s'here" (line 35). Where Carol (line 30) previously completed Dana's proposal by joining in overlap, Dana now completes Carol's proposed explanation by supplying a clause that ties the explanation to what they see on the screen. Carol ratifies their joint construction with a quietly spoken "right" (line 401). Dana's next turn (line 42) is so-prefaced, marking its dependency on the understandings just established while at the same time moving out of that sequence to new matters. By using their newly developed understanding to plan their next step, Dana displays what Waring (2002) has described as "substantive recipiency" (p. 464).

ORGANIZATIONS OF INSTRUCTION AND COLLABORATION

To build a robust program of research related to CL, we need to begin from a basic understanding of how instruction and collaboration are organized. Though they are distinct phenomena, they can be considered to be "co-operating" organizations in that they can be simultaneously drawn upon to accomplish certain sorts of things.[10] To better understand what they are and how they operate together, we need to define them in terms of observable practices.

When I refer to interaction as instructional, it is so, not because it occurs in a classroom or because it was interaction managed by a teacher. It is instructional because it does a certain kind of work. It is a way of organizing interaction such that one member is produced as the more knowledgeable with regard to some matter. It also establishes what will count as knowledge for current purposes. Instruction, therefore, is a type of understanding and what it achieves is *knowledgeability* (Macbeth, 2004). The important point here is that interaction becomes instructional in the very ways that it is done, in the ways that it is witnessably organized. Since much of what transpires between teachers and students in classrooms does precisely this kind of work, teacher-

student talk often (but not always) qualifies as instructional interaction. A considerable amount of CA-based work has been done studying the organization of interaction in educational settings (e.g., Koschmann, Glenn, & Conlee, 2000; Koshik, 2002; Lee, 2007; Lerner, 1996; Macbeth, 1991, 2004, 2011; McHoul, 1978, 1979; Payne, 1976; Payne & Hustler, 1989; Zemel & Koschmann, 2011).[11] But instruction is by no means restricted to classrooms and formal pedagogical settings. If someone asks me for directions, their question and my response serve to establish me as a local authority with regard to the matter in question. Exchanges like this, therefore, also qualify as instructional and they are ubiquitous.

A second sort of organization with natural relevance to CL-based activities is collaboration. Collaboration (literally "laboring" + "with") is another kind of understanding. It is a way of organizing an activity as if the participants share a goal or task orientation. Note that I say *as if*, because we have no way of truly determining (either as participants or as analysts) whether or not observed participants are actually pursuing the same goal except what we can infer from their embodied actions. "Intersubjectivity," "mutual understanding," "common ground" and the like speak to the same issue: how do we know what others know? We have no direct knowledge of what participants hold in common, our knowledge is only of what they *do* to organize their interaction as if at least some things were mutually understood.[12] Despite this, we regularly and routinely carry out all manner of concerted activities. The work of organizing our interaction with others as if mutual understanding was secured is the interactional work of collaboration of which we have been speaking. It is based in the myriad ways in which we display an orientation to a shared task or goal. Our ability to fluidly coordinate our actions with those of others, then, is collaboration's achievement. Like instructional interaction, collaborative interaction is not only found in classrooms, but is seen everywhere and every-when. There is an extensive literature consisting of CA-based studies of collaboration in the workplace (Goodwin & Goodwin, 1996; Heath, Sanchez-Svensson, Hindmarsh, Luff, & vom Lehn, 2002; Koschmann, LeBaron, Goodwin, Zemel, & Dunnington, 2007; Murphy, 2005; Nevile, 2004, to name just a few).[13]

However, when we turn to collaboration in educational settings a puzzle arises. As mentioned at the beginning of this chapter, we are treating CL as a class of teaching methods in which learners are engaged in a variety of instructional activities carried out in collaboration with their peers. How can such an approach be instructive, however, if it doesn't produce one member as the more knowledgeable? One of the distinguishing

features of this kind of teaching, in fact, is that it doesn't employ rigid roles of instructor and instructee. In the Roschelle materials, neither Dana nor Carol was *the* expert. Carol's presentation of a candidate explanation and Dana's uptake of that proposal, however, served to produce Carol as a local authority, if not with regard to what was happening on the computer screen, at least with regard to *her theory* of what was happening on the screen. In this way, they can be seen to instruct each other in turns and as their advancing work requires. The *it* in Carol's pre-announcement, "Y'know what I think it is¿" (Excerpt 1, line 6), is left "evidently vague" (Garfinkel, Lynch, & Livingston, 1981, p. 135). Positioned as it is after Dana's previous report of a failure to understand, it might be heard as referring to the un-understood matter. It could also refer, however, to the goal of their overall project, the assigned task of elucidating the mechanism of the observed simulations (Koschmann & Zemel, 2009). In it we see some of the possible ways in which participants work to display an orientation to a common task. Evidence of both instructional and collaborative interaction can be seen, therefore, in the fragment discussed previously.

Understanding just how collaboration and instruction are carried out together is one of the places in which CA can make important contributions to scholarship on collaborative learning. There is small but growing literature examining how CL-based activities are organized interactionally (e.g., Koschmann & Zemel, 2009; Lindwall & Lymer, 2008; Ford, 1999; Roschelle, 1992) and, hopefully, there will be more work in the this area in the future. We will now look at how the three CA constructs introduced earlier—turn design, sequence construction, repair organization—are relevant to the work of instruction and collaboration.

Turn Design in Instructional Interaction

In the classroom students are generally not free to self-select for next turn at talk. The common refrain, "Raise your hand and wait for me to call upon you" alters the functioning of the Turn Allocation Component of the Sacks et al. (1974) 'simplest systematics' model. McHoul (1978), in one of the earliest CA papers to focus on classroom interaction, proposed a modified version of the 'simplest systematics' model designed to reflect the institutional arrangements relevant to talk in the classroom. It seeks to accommodate the fact that teachers play a special role in turn allocation. This is part of what makes classroom talk recognizably "institutional" (Heritage, 2005). When teachers engage in 'classroom management' activities they do so through instructional

interaction as defined earlier, but they do so in a special sense. They establish themselves as local authorities on classroom decorum, while simultaneously providing instruction into what such proper decorum might be.

This is not the only way in which classroom talk departs from the simple model of turn construction described by Sacks et al. (1974). The notion of conversational participation also needs to be a little better elaborated. Schegloff (1995) clarified that a 'party' to talk need not be an individual speaker. Participants may speak for themselves, but in some situations, they speak on behalf of some sort of situationally-relevant group and, under these circumstances, it is the group that becomes the party to the conversation. This has particular relevance to classrooms. Lerner (1996) observed, "when a teacher presents a lesson to the whole class, the students participate in part as co-incumbents of a single association—'the class'" (p. 218). In addition to the teacher's active role in allocating turns, therefore, the way in which the body of students is addressed and responds as a "collectivity" (Lerner, 1996, p. 228) also alters the systematics of turn construction in classrooms.

A clear example of collaboration in the design of a turn can be seen in teachers' use of "designedly-incomplete utterances" (Koshik, 2002). This is a commonly used device for structuring student responses in the classroom. Here a TRP is created, but the TCU that preceded it is produced as hearably incomplete, often ending with a prolongation of the final syllable and a rising intonation. This makes relevant the provision of a candidate completion by one or more volunteers from the class. Lerner (1995) has described how this same device is sometimes used in peer-to-peer interaction as well. In this we not only see turns being constructed collaboratively, but also a way in which the design of a turn supports the work of doing collaboration.

Before leaving the topic of turn design, it is worth noting the important role that gestures can play in the production of instruction and collaboration. We saw, for example, how the gestures produced by Carol in Excerpt 1 were instrumental in the development of her explanation (Roschelle, 1992). The production of a gesture is carefully choreographed with its accompanying talk. Hindmarsh and Heath (2000) described how the enunciation of particular terms within an unfolding turn punctuate the affiliated gestural performance, "displaying just the moment at which it is sequentially relevant" (p. 1864).[14] They wrote, "Whereas we might normally think of gestures as working to support the talk, here we see how the talk reflexively works on behalf of the gesture" (p. 1864). Gestures are formulated in particular ways and not others to produce

particular forms of understanding and this has been documented in instructional settings (e.g., Koschmann et al., 2007). For teachers and students alike, gestures contribute in important ways to the design of turns, in some cases playing a role in the selection of the next speaker and often revealing just how the turn is to be understood (Koschmann & LeBaron, 2002).

Sequence Construction in Instruction and Collaboration

It is a commonplace observation that classroom talk is dominated by teacher question asking. McHoul (1978) noted, "In the classroom situation [the adjacency pair] becomes an 'utterance-triad', question-answer-comment on the sufficiency of that answer (A-A-C)" (p. 191). Such sequences, in fact, are the distinctive signature of classroom recitation. In the literature on classroom discourse these are often described as IRE sequences (Inquiry, Response, Evaluation).

How does the production of evaluative triads in classrooms align with the previously made proposal to study sequences in terms of adjacency pairs? Schegloff (2006) offered the following thoughts:

> Some students of talk-in-interaction take the basic minimal size of a sequence to be *three* turns ... From this point of view, two-turn sequences are elliptical; they are missing something, ordinarily their third turn—a view which may reflect its origin in the study of classroom interaction. [We take the position] that the basic, minimal form of a sequence is *two* turns, and that sequences composed of more are expansions. On the former view, it is the absence of a third turn in a two-turn sequence which requires explanation. On the latter view, it is the presence of additional turns in sequences longer than two turns which requires analytic accounting. (footnote 1, p. 22)

Schegloff made a distinction between a basic dyadic sequence with a third-turn expansion and *true* triadic sequential structures (p. 224). IRE sequences belong to the latter category. They are recognizable as such by virtue of the fact that withholding the third turn in such sequences is treated by participants as an accountable matter. Given that we are now working with a triadic structure, a new system of designation is required. Where previously we had just first and second pair-parts, we now have first, second, and third *triple*-parts.

McHoul (1978) reported, "there is a mutual orientation on the part of teacher and selected-student to have that student produce sufficient answers, where the decidability of that sufficiency is a matter for teachers and teachers only" (p. 190). That sufficiency is established in the third triple-part. It is helpful to note that the queries constituting the

first triple-part generally pertain to matters already known to the teacher and the fact that it is a 'known-answer' question is displayed in the third turn (see Mehan's [1979] "What time is it, Denise?" example). As Macbeth (2004) describes, "What these direct instructional sequences yield, and what they are posed to yield, is something like accountably correct answers, and, by implication, knowledge and competence" (p. 704). They are, in short, a method for doing instruction as described earlier. How this gets worked out in the moment, however, can sometimes get complicated. There are a variety of trajectories that the sequence can assume (Lee, 2007). The teacher, for example, might produce a positive assessment in the third turn thereby ending the sequence, but there are other possibilities—the teacher, for example, might repair the student's answer, restate the question, possibly in a different way (Zemel & Koschmann, 2011), or negatively assess the student's response and solicit an alternative. How the third turn in the sequence is designed may reflect differences in pedagogical strategy (Koschmann et al., 2000).

Moving from teacher-directed, instructional interaction to collaboration, we can see how sequence organization is employed by students to order their actions within an assigned task. There is a need to coordinate just where they are in the unfolding activity and, for each step in the activity, there is the problem of translating an abstract instruction into an embodied action. Collaboration is achieved through the sequential organization of their talk. Ford (1999), for example, reported how the utterance "Two" (pp. 378-380), produced by a student working on an exercise with a lab partner, served to initiate a new course of action while simultaneously bringing the prior course of action to its close. She described the various ways in which the students used their worksheet as a resource for ordering their activity. The worksheet, in this instance, provided a means of specifying the next step in the procedure without having to actually describe it. The one-word utterance "Two", therefore, represents a directive to undertake the next step listed on the worksheet. The directive serves as a FPP making relevant not a vocal response, but an embodied action. As with all adjacency pairs, directive-action pairs can be elaborated through all the mechanisms described by Schegloff (2006).

The Role of Repair in Instruction and Collaboration

Schegloff et al. (1977) speculated that adult-child or parent-child interaction might be one place in which the preference for self-repair might not hold. They wrote:

> There, other-correction seems to be not as infrequent and appears to be one vehicle for socialization. If that is so, then it appears that other-correction is not so much an alternative to self-correction in conversation in general, but rather a device for dealing with those who are still learning or being taught to operate with a system which requires, for its routine operation, that they be adequate self-monitors and self-correctors as a condition of competence. (p. 381)

This would suggest that repair trajectories in the classroom might show a higher incidence of other-correction. McHoul (1990) undertook a study to see if correction in the classroom differed from the types of repair trajectories described by Schegloff et al. (1977). He focused his attention on cases of teacher correction in the third triple-part or student correction in the turn following it. The first would correspond to a two-turn repair sequence with other-repair and the latter to a three-turn repair sequence with self-repair. He reported that teacher correction in the third turn is infrequent but does arise in certain situations: "(a) where redirections and reformulations of questions (and/or cluings) have failed to generate self-corrections or (b) where a single (often procedural) question criterion is corrected so as to allow some other (often substantive) criterion to proceed to completion" (p. 375). He concluded, two-turn repair sequences with teacher correction "are formulated as last resorts or as completion facilitators" (p. 375). As Macbeth (2004) notes, however, classroom correction and the kinds of repair trajectories described by Schegloff et al. may not be strictly comparable phenomena.

Conversational repair pertains to intervals of talk in which "the ongoing trajectory of the interaction has been stopped to deal with possible trouble" (Schegloff, 2000, p. 209). Schegloff (1992) elaborated: "particular aspects of particular bits of conduct that compose the warp and weft of ordinary social life provide occasions and resources for understanding, which can also issue in problematic understandings" (Schegloff, 1992, p. 1299). Repair after next turn, he suggested, might be thought of as "the last structurally-provided defense of intersubjectivity in conversation" (p. 1295). Schegloff et al. (1977) made a distinction between *repair* and *correction*. They observed: "The term 'correction' is commonly understood to refer to the replacement of an 'error' or 'mistake' by what is 'correct'" (p. 363). But what they chose to treat as repair was "neither contingent upon error, nor limited to replacement" (p. 363). Thus, correction, as they used the term, is a subdomain of repair.

Correction and repair take on a different significance in classrooms:

> In such settings, explaining and understanding are very likely to constitute the main line of activity occupying the talk, and problems of understanding and dealing with

> such problems are endogenous to the core activities of the setting. … Discriminating the main trajectory of the interaction from temporary suspension of it for repair can be far less clear than in other, nonpedagogical settings. Yet this is crucial for the application of this domain of CA's resources to be warranted. Not every correction is *repair*; not every problem in understanding implicates the operations of *repair* for its solution. (Schegloff, Koshik, Jacoby, & Olsher, 2002, pp. 7-8, authors' emphasis)

Macbeth (2004) suggests that McHoul (1990) conflated two different treatments of correction. Correction, as defined by Schegloff et al. (1977), is a general mechanism oriented to negotiating and maintaining intersubjectivity, whereas classroom correction addresses a more specific institutional purpose. Macbeth argued that the two analytic constructs are not independent, but are instead "concurrent" (p. 719) or "co-operating" (p. 729) organizational domains. As he summarizes:

> Repair is implicated in the very organizational possibilities of [classroom] correction, as in the production of what a correct or correctable utterance, reply or response, could be. My point is that without the sense of difference and co-operation, we would not only lose the work and relevance of repair in classroom lessons; we would be left with an understanding of correction—irrespective of setting and occasion—that is uncoupled from the first work of common understanding and the organizations that ensure its recurrent achievement. (p. 730)

This 'first work' of ensuring common understanding stands logically anterior to classroom correction (Macbeth, 2011). It is a precursor as well to what we have been discussing here as the twin organizations of instruction and collaboration. Let us consider now how they are related to understanding.

RE-SPECIFYING UNDERSTANDING IN (AND AS) PRACTICE

In one of his later lectures, Sacks described an exchange between two speakers, Al and Roger (Lecture 3, Winter Quarter 1969). Though the analyzed exchange consisted of only four turns, Sacks used it to illuminate how understanding is done as a practical matter. In Sacks' terms, "the way Al has of showing that he see what Roger is doing is to do something that *fits* there" (LC2: 112, emphasis added). Sacks was proposing what might be described as a praxeological re-specification of understanding, that is a way of

re-conceptualizing understanding in terms of socially-organized and publicly-produced practices.[15] As he explained, speakers display understanding in the ways in which they organize their actions:

> Not to say, e.g., "I understand," or to say "What you said was ..." but to produce an action that fits there, and that sets up another which can fit with it. That is to say, probably from the kind of academic training one gets, one has acquired the idea that what 'understanding' means is to be able to paraphrase, or to be able to say what somebody means that they didn't say. Now, I think that the natural place for the notion 'understanding' is in something like this. In terms of sequencing in conversation and many other things, you do '*showing that you understand* something' when what you do is, not talk about it, repeat it, paraphrase it, etc.—*that* would normally mean that you're puzzled or doubtful. The way that you go about exhibiting your understanding is just to produce another that you intend belongs, given what just has been done. You can put another item in that is consistent with the sort of thing you figure they're doing. (LC2: 112-113)

Rather than treating understanding as a mental predicate, Sacks sought to locate it in the organization of the talk, in the very ways that each turn is 'fitted' to the kind of action that is being produced. Recognizing just what that action might be requires an analysis on the part of speaker and listener alike. And it is here that the notion of an 'analysis of an analysis' becomes relevant. As Heritage and Atkinson (1984) described:

> [I]n examining talk the analyst is immediately confronted with an organization which is implemented on a turn-by-turn basis, and through which a context of publicly displayed and continuously updated intersubjective understandings is systematically sustained. It is through this turn-by-turn character of talk that the participants display their understandings of the state of the talk for one another, and because these understandings are publicly produced, they are available for analytic treatment by social scientists. Analysts may thus proceed to study with some assurance the factual exhibits of understandings that are displayed and ratified at the conversational surface. (p. 11)

This could be clearly seen, for example, in the exchange between Dana and Carol discussed earlier. Examining the details of turn design, sequence construction and repair serves to orient our attention to the specifics of how understanding is produced in any particular situation. It helps us to understand understanding as an organizational matter.

This then represents the most fruitful point of convergence between CA and CL. CL, by its nature, involves a mix of instructional and collaborative interaction. For the conversation analyst, therefore, CL offers a natural laboratory for studying how understanding is produced in settings of collaboration. The findings that accrue from

such investigations would, of course, be invaluable to future research in CL, but CA has something of even greater value to contribute. The Sacksian treatment of understanding, a treatment that locates understanding in (and as) observable interactional practices, points in the direction of an entirely new way of studying CL. In dealing with understanding, not as a curricular matter abstracted and de-contextualized, but rather as a contingent, interactional accomplishment, CA lays the foundation for a new sort of inquiry. Instead of asking whether or not some curricular matter has been acquired, it seeks to discover what the participants themselves have produced as understood within their own conduct. The difference, though subtle, is a crucial one.

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FOOTNOTES

[1] The Sacks lectures were published in two volumes. When quoting from the lectures, therefore, I will provide the volume (i.e., LC1 or LC2) followed by a page number.

[2] A summary of these conventions can be found in Jefferson (2004). Examples of how a Jeffersonian transcript is produced can be found on Schegloff's excellent website: http://www.sscnet.ucla.edu/soc/faculty/schegloff/.

[3] For a more elaborate development of this point, see Livingston's (1987) discussion of 'bracketing' (pp. 55-58). Bracketing is a methodological requirement of all ethnomethodologically-informed inquiry and ties back to its philosophical roots in phenomenology (Langsdorf, 1995). The notion of 'ethnomethodological indifference' is closely related to this notion of bracketing.

[4] Ford et al. (1996) describe some of the details of how this is done. Garcia and Jacobs (1999) raise the question of how the Turn Allocation Component might operate within CHAT interaction. This is of special interest here, since it is becoming more and more common to utilize CHAT-based communication within CL activities (see, for example, Stahl, 2010).

[5] Schegloff (1992, pp. 1320-1324) also describes a four-turn repair sequence. If a single-turn repair represents a mis-speaking, a four-turn repair sequence would occur when the original speaker treats the listener's response as presenting evidence of a mis-hearing. These are the least common type of repair sequence and we won't deal with them here.

[6] The notion of preference in CA is not limited to repair. Sacks (1992, LC2: 414-415) talked about the difference between "'*Yes*' – *period*" and "'*No*' – *plus*" responses. Negative responses require elaboration, while positive responses do not. He offered this as evidence of a preference organization in question-answer pairs. Other kinds of adjacency pairs may display other forms of preference (see Chap. 5 in Schegloff, 2006).

[7] Further details can be found in Roschelle's dissertation (1991) and Koschmann and Zemel (2009). The fragment presented here corresponds to Episode 1 in Roschelle's (1992) report, but continues a bit beyond it. It is picked up in Excerpts 6 and 5 in Koschmann and Zemel (2009). I thank Alan Zemel and Manny Schegloff for their helpful suggestions with regard to the transcription of this fragment and how it might be described.

[8] It is considered a *pause* and not a *gap*. Sacks et al. (1974) made a distinction between pauses, gaps, and lapses. They defined the terms in these ways: "intra-turn silence (not at a transition-relevance place) is a 'pause', and initially not to be talked in by others; silence after a possible completion point is, initially a gap, and to be minimized; extended silences at transition-relevance places may become lapses" (Footnote 26, p. 715). Dana's pause comes before a TRP, so it is considered to be 'owned' by her.

[9] This harks back to a distinction made by Sacks (1992) between *proved* demonstrations of an understanding and *claimed* understanding. He wrote:

> Things like, e.g., at the end of some first story a recipient says "I know just what you mean." Period. We can say that that's a claimed understanding as compared to having some way to produce some materials that *exhibit* an understanding. (LC2:252)

[10] I borrow the term from Macbeth (2004) who was discussing a different pair of "co-operating" organizations. As we will see in short order, he was describing the organizations of classroom correction and conversational repair.

[11] See Watson (1992) and Heap (1997) for earlier reviews of this literature.

[12] See Koschmann and LeBaron (2003) for further development of this point.

[13] While most CA-informed work examining interaction in the workplace has focused on collaboration, there have been notable exceptions. Goodwin and Goodwin's (1997) account of one witness's sworn testimony in the Rodney King trial is as good a description of instructional organization as you could hope to find.

[14] See, for example, Maria's lifting gesture in Exhibit 1 in Koschmann and LeBaron (2002).

[15] Sacks was not alone in seeking a shift from the ascription of mental predicates to the study of practice. Similar proposals were made by ordinary language philosophers and in early writings in ethnomethodology (Koschmann, 2011).

Rule 1: On arriving at a “transition-relevance place” (TRP),

(a) if the next speaker has been designated by the current speaker or another speaker self-selects to speak

(b), then the current turn ends and a new turn is initiated,

(c) otherwise, the current speaker continues with a another “turn constructional unit” (TCU).

Rule 2: Reapply Rule 1.

Figure 1: The Turn Allocation Component of Sacks et al.’s (1974) ‘simplest systematics’ model.

Excerpt 1

01 3:30:17 Dana: **What I don't understand is ho::w (.) the**
02 **(length thing/lengthening)** (0.2) **the:-**
03 (.) **the positioning of that arrow:** (1.5)
04 3:30:23 Dana: ((*traces the initial position of the velocity*
05 *vector on the screen using the cursor*))
06 3:30:24 Carol: **(.hh) Oh y'know what I think it is¿=It's**
07 **like the ⌈li:ne (.) (that/fat) arrow is the**
08 **li:ne, of where it ⌈pulls that down. Like see**
09 **how that makes ⌈this dotted li:ne?**
10 **(.hhh)**/(0.2) **That was the black arrow:.**
11 (.) **It ⌈pu:lls it.**
12 3:30:26 Carol: ⌊((*traces the acceleration vector*
13 *with forefinger of her right hand*))
14 3:30:28 Carol: ⌊((*using thumb and*
15 *forefinger gesturally pinches the tip of the*
16 *velocity vector and pulls it down*))
17 3:30:30 Carol: ⌊((*retraces the acceleration*
18 *vector twice with her forefinger*))
19 3:30:33 Carol: ⌊((*repeats pulling gesture*))
20 (0.2)
21 3:30:34 Dana: **mn.hhh (Nw)you're saying ⌈this is the black**
22 **arrow?=**
23 3:30:35 Dana: ⌊((*traces the*
24 *acceleration arrow with the cursor*))
25 3:30:36 Carol: **=Yeah.=**
26 3:30:36 Dana: **=And it ⌈pull:s the other arrow ⌈on its**
27 **hinge.**
28 3:30:37 Dana: ⌊((*traces the resultant vector with*
29 *the cursor*))
30 3:30:38 Carol: ⌊**on its**
31 **hinge.**
32 (0.8)
33 3:30:40 Carol: **It pulls the other arrow on its hinge**
34 **down to the tip of the black arrow,**(1.0)
35 3:30:45 Dana: **making the line that you s'⌈he:re.**
36 3:30:46 Dana: ⌊((*traces the*
37 *trajectory of the black ball with the*
38 *cursor*))
39 (0.8)
40 3:30:47 Carol: (°**Right.**°)
41 (0.2)
42 3:30:48 Dana: **So if you were to ha:ve like** (0.4) **this**
43 3:30:51 Dana: ⌈**Who:a.**
44 3:30:51 Carol: ⌊**Who:a. Put that back.**
45 3:30:53 Dana: **I, can't move that or, like, am I**
46 **not allowed?=**
47 3:30:55 Carol: =((*coughs*)) **I wouldn't mess with it**