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Going for the zone: the social and cognitive ecology of teacher–student interaction in classroom conversations

Frederick Erickson

Introduction

Social interaction as a learning environment

Research and theory construction along neo-Vygotskian lines has presented cognition in a new light: as socially situated (a kind of production that makes purposive use of tools, including those others have made) and as transpersonal (a distributed phenomenon, not simply something residing within a single head). This makes for a profound change in how we think about thinking, about learning, and about teaching – participation by teachers and pupils in nonverbal interaction and in oral and written conversation – the interaction among people that fosters learning.

Learning becomes not simply the internalization of knowledge and skill by an isolated mind interacting with a physical surround or even with a surround containing humanly produced artifacts. Rather, the organism–environment relation is one of interpenetration and of reflexively constitutive activity. The learning environment is not one designed at a distance by a curriculum developer or by a teacher as a First Cause and Unmoved Mover, as if the educator were analogous to the eighteenth-century Deist’s conception of a watchmaker God who builds the universe, winds it up, and then stands at the margins of Creation, letting it run its course.

This view of relations between teacher and learner, expert and novice, is a radically proximal one in which there is conjoint participation and influence, one in which no mover is unmoved. In such a view of teaching and learning the Word is indeed made Flesh, that is, immanence replaces distal transcendence in our understanding of the relations between teacher and learner. Moreover, the learner is seen as having the same agentive footing in the interaction as the teacher. In the former view of teaching, the teacher was seen as the subject and agent and the
pupil as the object and patient. In the new view, the student is seen as active, influencing the teacher while being influenced by the teacher.\(^2\)

How does the mutual influence we call teaching and learning actually take place in and through immediate social interaction? Neo-Vygotskian work has emphasized the important role of social interaction in learning. It points to the engagement of expert and novice in the zone of proximal development (ZPD), through which the more expert party in the interchange helps to complete and extend the actions and insights of the less expert one.

Yet, if social interaction is seen as crucial for learning, we must not leave unexamined the notion of social interaction itself. My sense is that in much of the neo-Vygotskian work, what has occupied the foreground of attention is the cognitive or linguistic changes that occur in the learner rather than the processes of interaction through which such changes are seen as being stimulated. Analyses of transcripts of expert–novice dialogue focus on the content of speech rather than on the process of interaction in tandem with its manifest content. In other words, interaction as a social and behavioral process seems to be treated as a residual category in discussions of engagement in the ZPD. Thus it is possible that unexamined assumptions about the nature of social interaction (and of conversation) as a medium for learning and teaching may be constraining the ways in which pedagogical transactions are being viewed.

It seems to me that conceptions from recent work in the study of the organization of immediate social interaction can make more rich the notions of activity and of engagement in the ZPD that are being used by those I have been calling neo-Vygotskians and who might even more appropriately and inclusively be called neo-interactionist researchers on learning. In the remainder of this chapter, I will review certain issues in the conception of human interaction in face-to-face conversation. Then I will illustrate those issues with an example of conversation from a kindergarten–first-grade classroom.

**Conceptions of social interaction**

Neo-Vygotskian discussions of engagement in the ZPD place special emphasis on two aspects of social interaction – the dyadic and the reciprocal. Perhaps because of the origins of the notion of ZPD in the interactive experiments of Vygotsky, the learning situation is seen as one involving a single expert and a single novice (see, e.g., Vygotsky 1978; Wertsch 1985; Wood, Bruner, & Ross 1976).

Dialogue is a powerful and evocative metaphor for the transformative engagement that happens in conversation. Yet the organization of talk in classrooms is not literally dialogic, that is, classrooms are not just settings for verbal exchanges between pairs of individuals in isolation from others around them. That view comes in part from idealized images of pedagogical conversations such as that of Mark Hopkins and a student sitting on either end of a log, or of the teacher–student dialogues from classical, medieval, and renaissance educational texts (which themselves probably derive from Plato’s idealized presentation of Socrates in dialogue with one primary interlocutor at a time). Prescriptive models of “good teaching” often treat classroom conversation as if it were a series of one-on-one engagements between the teacher and a succession of students. Classroom etiquette for recitation (nowadays considered an aspect of classroom management) and the ubiquity in whole-class discussion of what many researchers call the IRE discourse sequence (known information question initiated by the teacher, followed by a response by a student, followed in turn by evaluation of the response by the teacher) may imply a cultural model of “one speaker at a time and pairs of speakers in dialogue” for the social participation framework of ordinary classroom conversation.\(^3\)

Admittedly, some empirical research on classroom discourse does show sustained interaction between a teacher and a single child that has the overall appearance of dialogue. A wonderful example comes from the work of Wertsch (1990, 113–114) who shows a scene of classroom interaction in which a student is appropriating the voice of the teacher more and more completely across successive turns at talk in dialogue with the teacher.

Danny, a kindergartner, has brought a rock from home for “Show and Tell.” He first presents the rock in terms of its relation to himself: “My mom went to the volcano and got it. . . . I’ve had it ever since I was . . . . I’ve always been taking care of it. It’s never fallen down and broken.” Then the teacher shifts referential perspective to an objective, taxonomic one. Danny adopts this perspective in his next utterances (17, 19, 41), appropriating the teacher’s voice:

(14) T: Uh hum. Okay. Is it rough or smooth?
(15) CI: (Danny): Real rough and it’s . . . . and it’s . . . . and it’s sharp.
(16) T: Okay. Why don’t you go around and let the children touch it. Ok okay? (CI takes it around the group, which is sitting on the floor.)
Is it heavy or light?
(17) CI: It’s heavy.
(18) T: It’s heavy.
(19) CI: A little bit heavy
(As discussion continues, the teacher opens a child’s dictionary and reads from it under the heading “lava.”)
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human social interaction is conceived as a ping-pong match. Successful participation by speakers, and the influence of one speaker on another, are seen as involving syntagmatically appropriate matchings of one person’s initiation with another person’s response across successive moments in real time, (e.g., if person X asks a question, then person Y is accountable for answering it at the next appropriate moment).

Yet this emphasis on sequential reciprocity (which centers our attention on turntaking in oral discourse) overlooks the complementarity of simultaneous participation in interaction by interlocutors. More than turntaking is going on. At the same moments in which the speaker is speaking, the listener is listening. Because the speaker can see as well as hear, whatever the listener is doing nonverbally (and verbally) is available as evidence that what the speaker is saying is being received by the auditor.

Thus mutual influence between interlocutors happens simulaneously as well as successively as they converse. The issue for the practical speaker in articulating his or her actions with those of other participants is not just to take account of what someone has done the moment before, what I need to do now, and what they will do next. Articulation of action also involves taking into consideration what others are doing while I am doing something in the present moment (see Condon & Ogston, 1967; Erickson, 1986; Erickson & Shultz, 1982, 70–77).

In sum, as teachers and students interact in classrooms, they construct an ecology of social and cognitive relations in which influence between any and all parties is mutual, simultaneous, and continuous. One aspect of this social and cognitive ecology is the multiparty character of the scene – many participants, all of them continually “on task,” albeit working on different kinds of tasks, some of which may be at cross purposes with others. Although teachers in group discussion may attempt to enforce a participation framework of successive dyadic teacher–student exchanges, often the conversation is more complicated than that. The conversations that take place are multiparty ones, and they may be ones in which various sets of speakers and auditors are engaged simultaneously in multiple conversational floors (see, e.g., Shultz, Florio, & Erickson, 1982, for a discussion of conversation in the classroom that will be considered in detail in this chapter, and see Au & Mason, 1981, for a discussion of reading group conversation in classrooms of native Hawaiian pupils).

Another aspect of the social and cognitive ecology of interaction in the classroom – a system of relations of mutual influence among par-
participants — involves the combination of what I have called here the reciprocal and complementary aspects of the organization of immediate social interaction in real time. Interaction, it would seem, always involves the articulation of both successive and simultaneous actions, verbal and nonverbal, by those engaged in it.

Given the complexity of reciprocal and complementary organization that is necessary to accomplish a multiparty conversation successfully, we must ask, “How does the sociocognitive ecology work in classroom conversations? How is the collective action done so that interactional (and cognitive) traffic jams do not occur and so that there is an opportunity for understanding and learning?” In attempting to answer such questions, we may come to see how insights gained from analysis of the workings of interactional traffic management in classroom conversations can inform a theory of cognition and learning as situated, collective, and purposive human activity.

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Traffic management in interaction: timing and contextualization cues

Timing appears to be what holds the whole ecology of interaction together in its performance. The relative temporal location of the various actions of interlocutors is an important aspect of the ordering of the collective activity of conversation in both its reciprocal and its complementary aspects. We can speak of timing as one aspect of a dialectical process in interaction that has been called contextualization by Gumperz (1982; see also Erickson, 1992), entailing a system of signals he calls contextualization cues. The notion of contextualization follows that of Bateson (1956), who observed that because of an inherent ambiguity in systems of communicative signs, those engaged in interaction need to regulate it by signals that point to the relevant context of interpretation in which other signs are intended to be “read.” Thus sets of communicative displays contain, within the surface structure of their performance, certain behavioral features that function as cues that point to their proper interpretation. In other words, the enactment of communication reflexively creates its contextual framing at the same time as it is being framed by its context.

In the timing of immediate social interaction, such as in face-to-face conversation, an especially important contextualizing function appears to be performed by the temporal placement of points of emphasis in speech prosody (volume and pitch shifts) and in body motion (postural shifts, gaze, changes in direction of motion in gesture). The points of emphasis appear to function as contextualization cues that signal expectations at various levels. Not only do individual cues of verbal or nonverbal emphasis enable one to anticipate immediate next moments, but because they tend to cluster together in regular intervals of occurrence, the clusters of points of emphasis in speech and body motion often can be perceived as a cadence. This cadence is a rhythmic underpinning that enables the various participants in a conversational interchange to anticipate the projected courses of action of individual interlocutors and of the conversational group as a whole (see the discussion in Erickson, 1991).

The presence within communicative behavior of contextualization cues for the regulation of interactional timing enables interlocutors to “read” the ongoing course of the conversational roller coaster as they are riding along in it. This makes it possible for interlocutors to act on their anticipations by “going for” crucial functional places that are turning points in the reciprocal (syntagmatic) order that will occur as oncoming moments ahead in the interaction’s ongoing course. (This is akin to the way in which a pianist “goes for” the next chord in a harmonic sequence, temporally in terms of the flow of the music as well as kinesically and spatially by reaching for the keys on the piano keyboard. See Sudnow, 1978 and 1980, for discussion.)

In terms of the organization of discourse in conversation, the cadence stress pulses usually occur at points of midcourse correction, points of turn completion and turn exchange, and points of crucial information and “keying” (e.g., irony, seriousness). In terms of nonverbal activity, cadence emphasis often occurs at points of exchange of objects (such as one person handing another a hammer) or of one person opening to a page in a book as another person is calling out the page number. Somewhat as traffic lights signal the timing of the flow of cars across intersections (the regular timing of the light change enabling drivers to take strategic account of what the next light on the road ahead is doing), the contextual cues of what can be called verbal and nonverbal prosody seem to signal the timing of crucial functional moments in syntagmatic sequences of individual actions in a conversation so that they can be done in a jointly articulated fashion rather than haphazardly. Such concerted action is social in that the various social actors take intended (read “meaningful”) actions in account of the intended actions of others.

Thus, as we are engaged in the moment-by-moment unfolding of an actual conversation, it is not only necessary to have an abstract capacity to understand a speech sound or comprehend a grammatical string. It is also important to be able to hear just this strip of speech and/or see just
this strip of gesture at the right time. Given the limits on human information processing and the huge number of verbally and nonverbally communicated information bits in the air at any one moment in a conversation, for an interlocutor to receive intelligible information or to produce it requires the capacity to "go for" crucial moments in the discourse, attentionally and in uttering, and to disattend and not utter in other moments that are noncrucial. Otherwise, we would be continually overwhelmed by data we could not even handle perceptually, let alone process cognitively.

This sense of "rightness" of time is pointed to by a distinction in Greek between time in a technical or physical sense and in a social and phenomenological sense. The former conception of time is meant by the term *chronos*, from which we derive terms for clock time and for the quantitatively uniform measurement of units of time. The latter understanding is meant by the term *kairos*, which refers to the developing or unfolding quality of time: change of seasons, of weather, of crucial turning points in history. This is time as humanly experienced: "in the fullness of time"; the emergent "not quite yet"; the "now" that, once arrived, feels right.

In human social interaction, *kairos* timing results from the mutual activity of the interactional partners. It is not absolutely regular chronometrically; there is an ebb and flow of speeding up and slowing down that in music is called *rubato*. Yet conversational partners share a mutually enacted timing that is remarkably predictable. At some moments, it is almost chronometric, but not quite. At other times, rhythmical stress in speech and in body motion (i.e., posture, gesture, and gaze) is virtually metronomic in its chronometric regularity. At this point, the significance of *kairos* timing for the organization of interaction is only beginning to be realized (see the discussion in Auer, 1992; Cooper-Kuhlen, 1992; Erickson, 1982, 1992; Erickson & Shultz, 1982, 72–74; Scollon, 1982).

In sum, we can say that timing enables nothing less than the social organization of attention and action in conversation. Moreover, we can say that the timing of interactional performance is accomplished by contextualization cueing. Hence when we say that cognition and action are situated in sociocognitive learning environments, we mean, among other things, that they are situated in real time — not an ideal "time-out" condition for reflection and deliberation but an actual, ongoing development of sequences of interaction, moment by moment, in which one is never completely sure of where the interaction is going next and during which the time clock never stops.

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A classroom example

"I can make a 'P'"

This example comes from a kindergarten-first-grade classroom in a working-class Italian-American neighborhood in a suburb of Boston. Other aspects of interaction in this classroom and in the homes of focal children in the class have been reported separately.4 This particular classroom is an especially appropriate setting for illustrating the multiparty organization of interaction at the ZPD. This is for two reasons. First, the classroom was one in which what the teacher called "interrupting" happened frequently, that is, students often spoke overlappingly, blurring the boundaries between sequential turns at talk. The teacher noted this with some exasperation. One reason for the ubiquity of overlapping talk may have been, in part, the ethnic cultural communication style. Evidence from observation of two of the Italian-American students while they were interacting at home with family members suggests that speaking when someone else was speaking was usually seen in the family as an indication of interest and agreement (cf. Shultz et al., 1982). Another intention in overlapping talk may have been less benign in the classroom, however. Overlapping another speaker, as well as other conversational moves that were even more overtly aggressive, may have been a strategy for taking a turn at talk away from the student who was the teacher-designated speaker of the moment. (In the ensuing discussion, I will characterize as "turn sharks" those who tried to steal turns from other children who were teacher-designated speakers. The use of "shark" rather than "bandit" as a metaphor here emphasizes the more violent action quality of attack rather than the less violent action quality of theft of another's turn.)

The second reason this classroom provides an apt example for our discussion here is that it contained students with two different levels of expertise in student conversational roles. Among the students were those who were experts and those who were novices in the social management (and manipulation) of classroom talk. In any given year the kindergartners were newcomers to the classroom, unfamiliar with the customary conversational arrangements that obtained there. The first graders, however, were second-year veterans in classroom conversations. During the previous year, they had become familiar with the routine participation structures or frameworks — the allocation of communicative roles among conversational partners — by which classroom conversations usually proceeded (see O'Connor & Michaels, this volume, for further discussion).
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speaker, the second speaker’s first word begins just to the right of the last word uttered by the prior speaker, as at (29–31) and (64–66). Overlapping speech is indicated by this symbol: []

Alternation between speakers with no gap and no overlap (“latching”) is indicated by this symbol: –

The teacher was seated on a low chair and the students sat around her on the floor.

(1) T: What did you do yesterday Angie? . . .

(2) A: um . . . (shrugs shoulders, then speaks softly, with breathy voice) I went over to

(3) T: Grammy’s . . .

(4) A: (Whisper voice) Talk a little bit louder . . . I can’t hear you . . .


(6) A: (shakes head, “No”)

(7) T: Do you have to go in the car to her house? . . .

(8) A: (nods head, “Yes”)

(9) T: What did you do . . .

(10) A: did you tell her all about school? . . .

(11) T: What did you tell her that you like best about school?

(12) A: um that I colored

(13) T: That you colored and what else

(14) A: Read a story . . .

(15) T: Right . . . remember the story we read? . . . What was the name of it? . . .

(16) A: (shrugs shoulders)

(17) T: The one about the bus . . .

(18) A: (nods head twice, “yes”)

(19) T: The one about the three billy goats

(20) other S: mo/ other S: /_________ that

(21) T: (turns to her right, points right finger, makes “sh” with lips but no speech)
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(22) other S: mother that too

(23) T: looks back to L What else do you like about school? . . .

(24) A: Play . . .

(25) T: What do you like to do best in school?

(26) A: Play

(27) T: blocks . . .

(28) (turns to her left, then points left hand to chalkboard behind her) blocks . . . is that your favorite thing? . . . You remember what the name of that letter is . . . that looks like a snake? . . .

(29) S-1: S . . .

(30) S-2: S . . .

(31) S-3: S . . .

(32) T: (looks around to her right at speakers, shakes head, "No," . . . and smiles) Sh . . . You're right but let's let Angie tell it . . .

(33) A: What's inside this microphone?

(34) T: (looking at Angie) Batteries . . . like in your flashlight

(35) Li: um Miss Wright

(36) T: (looking at Liza) What?

(37) Li: That's still . . .

(38) T: (looking at Liza) I know I . . . I can't find the e- raser Liza . . .

(39) S: . . .

(40) T: (looks around to her right at speaker) What?

(41) T: Do you know how to ride the two-wheeler?

(42) S: Miss Wright

(43) S: Miss Wright

(44) S: (same child as (38))

(45) T: You're a big boy . . .

(46) S: Miss Walsh (this speaker is not Bobby)

(47) T: Bobby's been waiting . . . let's . . . let's let Bobby talk . . . what (as Bobby speaks Angie looks at chalkboard and continues to do so as Bobby continues)

(48) B: Bro-ther (heavy emphasis)

(49) T: turtle

(50) T: (looks intently, curiously at Bobby)

(51) T: Brought a turtle to school? . . . is it a- live?

(52) B: (shakes head, "no")

(53) T: a dead turtle?

(54) B: he's a- live

(55) T: (smiles) Well he is alive then . . . yes he's . . .

(56) B: he's a jumping turtle

(57) T: (slight frown) a jump/. I never heard of a jumping turtle

(58) S: Miss Wright

(59) T: (Angie looks at the teacher. Before she speaks, she has been looking at the chalkboard, not at Bobby or at the other students)

(60) A: I can make a "P"

(61) T: (louder, smiling, still looking at Bobby) Oh . . . but I don't be lieve you . . . I never heard of a/ . . .

(62) T: (looks to her left, away from Bobby to another student who is sitting to Angie's left. Thus the teacher looks around toward Angie, but not as far around as the place where Angie is sitting)

(63) S: I have a fish down cellar . . .

(64) T: You have a fish in the cellar? . . .

(65) A: I can make a "P"

(66) T: I'll have to come and see this special house

(67) T: (turns to another child who wants to speak, not to Angie)

Notice that at the very beginning of this sequence (1–2) Angie did two things that made her turns especially vulnerable to interruption by the turn sharks. First, she hesitated at the beginning of her answer to the
teacher's question (at 1), “What did you do yesterday Angie?”, by saying “um” (at 2) and then shrugging her shoulders in silence. Only after that silence did she say, “I went over to Grammy’s.” Silence at the beginning of a turn designated by the teacher provided an opportunity for interruption by another student. At this moment in the conversation no students availed themselves of the opportunity for interruption, but Angie had made that opportunity available at the very outset of her colloquy with the teacher. This could have been seen by the turn sharks as the first evidence of blood in the water.

The other thing that might have invited interruption was the volume and voice quality of Angie’s speech. She spoke low enough that the teacher asked her to speak louder (at 3). In addition, Angie’s speech had a breathy quality that could be heard as hesitant. While she complied (at 4) with the teacher’s request to speak louder, she continued to speak in a breathy, “little girl” voice.

(3) T: (Whisper voice) Talk a little bit louder. . . . I can’t hear you. . . .
(4) A: (a bit louder, still breathy) I went over a Gramma’s

After the opening interactions in this sequence, Angie continued to do some of the things she had done at the beginning. At (6), (8), (10), (16), and (18) she answered the teacher’s questions nonverbally, nodding or shaking her head and (at 16) shrugging her shoulders a second time. We cannot know Angie’s communicative intentions for certain, but it seems as if her shrugs followed by silence may have been taken by other pupils as an invitation for someone else to answer the question.

Shrugging and waiting for something to happen next was a strategy that Angie employed frequently in the first few months of school. It may be significant that her second shrug (at 16) followed the first question by the teacher in this sequence that was truly teacherlike: “Remember the story we read? What was the name of it?”. That is a special type of request for information. As noted in note 3, it is one characterized in research on classroom discourse as a “known information question.”

Miss Wright waited as Angie shrugged. Then, still looking at Angie, the teacher prompted, “The one about the bus?”. Angie nodded her head twice, as if to say, “Yes” (at 18), while Miss Wright paused for her answer. Then (at 19) Miss Wright gave another prompt: “The one about the three billy goats?”. Immediately, (at 20) with no gap or overlap, two other students began to speak: “I told my mo/”. They were sitting to

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Miss Wright’s left. As they spoke Miss Wright turned to look at them, pointing her right finger in a “hold it” gesture and pursing her lips to make the “sh” shape, although she did not utter the “sh” sound.

(15) T: Right . . . remember the story we read? . . . What was the name of it? . . .
(16) A: (shrugs shoulders)
(17) T: The one about the bus . . .
(18) A: (nods head twice, “yes”)
(19) T: The one about the three billy goats I told my mo/.
other S: that
(21) T: (turns to her right, points right finger, makes “sh” with lips but no speech)

This seems to have stopped the other two students from continuing to speak. Yet notice that (at 20) Angie had not answered the teacher’s question, either verbally or nonverbally. The other two students then began to fill in Angie’s silence with their own talk.

Turning around to her left to look again at Angie, at (23) Miss Wright asked another question, “What else do you like about school?”. This was not a known information question. Angie had information the teacher did not know and she immediately said, “Play.” Then at (25) Miss Wright asked another question to which Angie alone possessed the answer, “What do you like to do best in school?”. Again Angie answered immediately, “Play blocks.” “Play with the blocks,” the teacher said, expanding Angie’s utterance slightly and thus modeling a more elaborated form of speech.

At (28) Miss Wright turned further to her left to look at the chalkboard behind her. Now she asked another question, and it was a known-information one: “You remember what the name of that letter is?”. She paused and Angie did not answer.” [The letter] that looks like a snake?” she prompted, tracing the sinuous letter with her hand. Angie still did not answer. “What . . .”, Miss Walsh began with another prompt.

In the silence of the turn allocated to Angie, three other students answered at (29–31): “S! . . . S . . . S . . .” Miss Wright looked away from Angie and around to her right at the speakers, shaking her head. “No,” and saying “Sh . . . You’re right but let’s let Angie tell it.” The turn sharks had struck again.
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framed by the teacher’s cues as the designated next speaker – the person who should answer the question just asked, and who should do so in the next moment of the discourse.

How do we know it is a next moment? How did the teacher, Angie, and the other students know when that “next” moment had arrived? We can infer that their inferences about the when of the answer slot have to do with the kairos timing cues discussed earlier. A succession of stressed syllables of speech mark a cadence together with markers of kinesic prominence, such as change in the direction of motion in a gesture, with shifts in postural position, and with shifts in gaze direction. Prior time intervals in that cadence could be taken as if they marked a metronome beat. Thus a succession of rhythmic, regularly spaced beats on prior moments enabled one, in the current moment of a “now” beat, to estimate how long it would be until the “next” beat would occur. Interactants could thus hold an expectation of the actual occurrence of a “next” and “go for” it, reaching for it by speech or gesture that projects a trajectory that will be completed on the cadence point of the next beat.

The following transcription (Figure 2.1), using musical notation, shows how the next moment for the answer “S” was being projected in Angie’s and the teacher’s interactional behavior. The transcription begins with the question by the teacher at (23), “What else do you like about school?”

Notice that in measure (2) there were two stressed syllables in the teacher’s speech, “else” and “school.” In measure (3), after a pause of exactly the same duration as the interval between “else” and “two” in the previous measure, Angie said “Play,” thus answering the teacher’s question. Notice a similar pattern in measure (5), where in the pause after the stressed word “best” in the teacher’s question “What do you like to do best in school?”, Angie said, “Play blocks.” In this case the word “play” was unstressed – said as a “pickup note” to the stressed word that followed, “blocks.” That stressed word came at the same time interval as that between the previous stressed word, “best,” and the pause in the teacher’s speech that followed. From this it would seem that the appropriate time for an answer to be uttered to a question by the teacher is either the next “beat” after the end of the teacher’s question or the next “beat” after that. If the cadence established across stressed syllables or words is approximately 1 second, then the student has 1 second, or at most 2 seconds, to respond to the teacher’s question. After 1 or 2 seconds, either the teacher will prompt the designated answerer (often beginning the prompt on the next beat after the silence by the student) or another student will attempt to answer.

In these cases, the questions asked for information that Angie alone
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knew, and she answered them with a stressed word uttered on the “beat” immediately after the end of the teacher’s question. This left no room either for a prompt by the teacher or for an attempt by another student to take away the answer turn by filling the rhythmically cued answer slot with an answer of his or her own.

Then the teacher revoiced Angie’s utterance, “Play blocks,” with a slight syntactic expansion, “Play with the blocks.” (Notice that in making this slight paraphrase, a shift to a more formally elaborated style by including the conjunction and definite article, the teacher echoed the rhythmical placement of Angie’s utterance; in the teacher’s utterance, primary stress still fell on “blocks,” with the previous syllables uttered as a triplet of “upbeats” preparing for the stressed word, “blocks.”) At measure (8) the teacher began to ask another question: “You remember what the name of that letter is?” Unlike the previous questions, this was a teacher-like known-information question. As the teacher uttered the question, she turned and pointed to the board.

Angie’s eyes followed the sweep of the teacher’s arm as Angie directed her gaze to the chalkboard where the teacher was pointing. But notice the first beat of measure (9) – the beat immediately after the end of the teacher’s question. Unlike the two previous occasions when Angie had answered on the next beat after the last stressed syllable in the question (measures 2–3 and 5–6), this time on the next beat after the teacher’s question Angie did not answer. In measure (9) the teacher responded to Angie’s silence with a prompt, “... that looks like a snake?” Still no answer. On the next beat the teacher started another prompt: “what.” As she said this, one other child answered “S” just after the beat. On the next beat, the second beat of measure (10), another child answered. Finally, on the next beat (measure 11), the teacher, who had by then looked away from Angie to the other speakers, addressed them by saying, “You’re right,” and went on to say, “but let’s let Angie tell it.” As the teacher said “you’re right,” she placed the stressed word on the immediately next beat, just as had Angie and the other children when they were filling answer slots after the teacher’s questions. Thus the teacher’s utterance, “you’re right,” on the second beat of measure (11) can be heard as an “answer” to the students’ saying “S” in answering the question that had originally been directed at Angie.

The turn sharks had been partially successful; they got the answer turn away from Angie with only a slight rebuke from the teacher. Thus we see that in a classical sequence of classroom discourse, an IRE sequence (teacher initiation, student response, teacher evaluation; see Mehan. 1979), informationally crucial syllables in the discourse sequence occur on
the beat, that is, the *let* in “letter” in the initiation slot, the “S” in the answer slot, and the “right” in the evaluation slot, “you’re right but let’s let Angie tell it.” (Notice in the evaluation utterance that not only is the informationally crucial word “right” uttered on the beat, but so is the other informationally crucial word, “Angie,” as the teacher indicates who the designated answerer was. Thus volume stress in that utterance underscores an item not only of academically relevant information, showing that the answer “S” was correct, but of social organizationally relevant information as well, showing who the designated answerer was.)

To provide further evidence of the importance of the cadence of stressed syllables in setting up the appropriate *kairos* moment for an answer slot in an IRE sequence, let us look at an earlier instance in the conversation in which Angie’s answers were interrupted by turn sharks. In the complete transcript this appears at (10–22). It is the strip of conversation just prior to the question about the letter “S.”

At (10) teacher asked a question of Angie that was not teacherlike: “What did you tell her you liked *best* about school?” Only Angie knew the answer and she answered promptly, on the next cadence “beat.” “Um, that I colored.”

In measure (3) of figure 2.2 we can see that Angie produced a stressed syllable on the second cadence beat, the syllable “um” and the syllable “co” in the word “colored.” (Perhaps the “um” was uttered as a rhythmic placeholder in order to occupy the answer slot and gain time to formulate an answer.) In measures (3–4) the teacher repeated “That you colored and what else?” On the next beat after “else” Angie answered. “read a story,” and on the next beat after that (the second beat of measure 5), the teacher confirmed the correctness of Angie’s answer by saying, “Right.” Then the teacher asked a different kind of question – a teacherlike known-information question: “Remember the story we read?... What was the *name* of it?” In the next beat after the end of that question (beat 2 of measure 7), Angie did not speak. Then on the next beat she shrugged her shoulders. The teacher responded with a prompt: “The one about the bus.” Angie immediately nodded twice (measure 9) on the first beat of the measure.

That answer was half right: by nodding “yes,” Angie showed that she remembered the story, but by not speaking Angie did not demonstrate that she knew the *name* of the story, which was the point of the question. (Angie may have been interpreting the teacher’s question literally, rather than as an indirect request that she give the name of the story aloud.) “The one about the three *billy* goats?” On the next beat after that (second beat of measure 10) Angie did not answer, and on the next beat (the first beat of measure 11), one other child and then other children began to say something. They were in the process of taking Angie’s turn away. The teacher looked at them and smiled but brought her finger to her lips in a “Sh” gesture. Angie was still the designated answerer, even though she had not spoken in the cadentially signaled answer slots given her by the teacher. When the other children began to speak on the beat that indicated an answer slot, they had become turn sharks who used their cultural knowledge of the customary timing of IRE utterances to attack Angie’s turn at answering.

**On the marriage of true minds in classroom discourse: Are turn sharks impediments to learning or not?**

From the perspective on the ecology of social interaction presented here, and as illustrated in the previous examples of classroom dis-
course, the interactional difficulty – or at least the fragility – of engagement between teacher and student in the ZPD should be apparent. Both Angie and the teacher were “going for” engagement in the zone. On two occasions the teacher turned to Angie and asked a series of questions to which Angie alone knew the answer. That simplified Angie’s interactional task of holding the floor while other students were vying for the teacher’s attention and conversational engagement. Angie answered those questions promptly, with words or nods that occurred on the next beat after the last stressed syllable in the teacher’s question. After a few questions that Angie alone could answer, the teacher asked a “teacherlike” known-information question. In both instances (the question about the names of stories read aloud yesterday by the teacher and the question about the name of the letter on the chalkboard), Angie hesitated. Immediately, other children – the turn sharks – filled in the answers. To be successful in going for the zone, Angie not only had to know the right answers to the questions, she also had to utter the answers in the right time so that the teacher could hear her utterance as an answer to the question asked and so that other students would not take away her turn.

We can speculate on the cognitive consequences of someone uttering the answer other than the answerer that was officially ratified by the teacher. If out of the group comes the information or idea needed to complete the discourse of the moment, it may not matter, for purposes of other students’ learning, which student’s voice actually utters the answer. Indeed, for the designated answerer who appears not to know the answer, like Angie, to have someone else answer could not only take her off the hook of being stuck without an answer, but also, by modeling the right answer, could give Angie an opportunity to learn. In such cases it would be fellow students who, by uttering a correct answer or by extending a fellow student’s answer (e.g., by elaboration), would be functioning as the teacher’s expert voice in the expert–novice dialogue ideally conceived as dyadic interaction in the original Vygotskian conception of interaction in the ZPD. In other words, the work of voicing and revoicing as scaffolding provided by the expert to the novice (whether the expert be a teacher, as in the chapter in this volume by O’Connor and Michaels and in the classroom example of Wertsch, or by a mother, as in the chapter by Snow and Kurland) can be done by various parties in the classroom, not just by the teacher. (This was especially the case in Angie’s classroom, where there were first graders as well as kindergartners.) This may explain why heterogeneous grouping can create a stimulating learning environment for students who are less adept than others.

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In the heterogeneous group, there will be more adept students who will voice and revoice the ideas and information to be learned.

Conversely, the teacher (nominally considered the expert) can do the work of a novice relative to the student, thus validating the student’s expertise. Angie’s teacher could be seen as taking on the role of novice in her initial questions about what Angie did after school and what she told her grandmother. In asking a student for information the teacher does not already know, the teacher becomes the learner. This recalls a strategy Cazden employed repeatedly in the inner-city class she taught in San Diego in 1974 (as reported in Mehan, 1979), in the same year in which Angie’s classroom was being videotaped in Boston. After a child gave a correct answer to a question by the teacher, Cazden would often say, “That’s right. How did you figure that out?” Then the child would explain the reasoning or computation process that led to the correct answer. This was a strategy to get the child to articulate reasoning the child might otherwise have taken for granted and to have that child model and explain that successful line of reasoning for other children in the class. But in terms of the Vygotskian model of expert–novice dialogue, such a question by the teacher in effect switches the two roles, with the student becoming the expert and the teacher becoming the novice who doesn’t yet know the new information – how the student “got” it (see also O’Connor and Michaels, this volume).

Thus we can see that in a conversational participation framework in which teachers and students are able to alternate the roles of expert and novice, members of the learning group can learn even if the one who utters the correct answer is not the designated answerer and even if the revoicing of a partially correct or cryptic answer is done by another student rather than by the teacher. In such a participation framework, scaffolding, appropriating voicing, and revoicing can be done alternately by varying members. In a sense these functions in interaction, which appear to be cognitively stimulating, are being done collectively rather than dyadically. This may be the way in which group learning takes place, with the group as a whole, as well as individual members, learning.

In the light of all this, we might want to rethink the metaphor of “turn shark,” since what the students did in taking away Angie’s answering turns may not have entirely inhibited her learning. Possibly the turn sharks, rather than being seen as attackers, might be better seen as rescuers – conversational dolphins. Their interventions did get Angie off the hook of being exposed as not knowing the right answer. In uttering the correct answer, the other children were modeling content knowledge for Angie, if not proper deportment as the teacher defined it.
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these conversations at the beginning of the school day, fantasy topics should not be allowed. That prohibition prevented talk about television cartoons the children had seen at home. Non-television-derived fantasy talk was encouraged at other points in the school day.

Immediately after Miss Wright questioned the legitimacy of Bobby’s turtle story, a number of other children began to vie for the floor, raising their hands and swaying forward and calling, “Miss Wright!” As the other children did this, so did Angie. She said (at 60) “I can make a P.”

(57) T: (slight frown) a jump. I never heard of a jumping turtle

(58) S: Miss Wright

(59) T: _______

(60) (Angie looks at the teacher. Before she speaks, she has been looking at the chalkboard, not at Bobby or at the other children)

A: I can make a “P”

(61) T: (louder, smiling, still looking at Bobby) Oh... but I don’t believe you... I never heard of a...

Turtles don’t fly... they don’t have wings... I think you’re making up a nonsense story...

(62) T: (looks to her left, away from Bobby to another student who is sitting to Angie’s left. Thus the teacher looks around toward Angie, but not as far around as the place where Angie is sitting)

(63) S: I have a fish down cellar...

(64) T: You have a fish in the cellar?...

(65) A: I can make a “P”

(66) T: I’ll have to come and see this special house...

(66) T: (turns to another child who wants to speak, not to Angie)

When Angie said “I can make a P” at (60), the teacher was still facing Bobby. She did not react to Angie’s utterance. Then at (62) the teacher looked away from Bobby to another student, who began to tell about a pet fish. At (65) Angie again said, “I can make a P.” But the teacher continued to look at the child talking about his pet fish and then turned further away from Angie to look at another child who would become the next speaker.

In these instances, the timing of Angie’s utterances seemed not incorrect (notice that at 65 Angie started to speak just after the pause after the teacher’s question at 64). But another dimension of appropriateness besides conversational rhythm needed to be taken into account. This was the teacher’s gaze and postural position relative to a designated speaker. Gaze and postural orientation were a signal of the direction of

As the teacher (at 32) began to move on to another topic (“We’re going to learn another letter today”), Angie asked “What’s inside this microphone?” It could be that she did this because she had just been the recipient of a long series of questions from the teacher and figured it was now her turn to ask the question. It could be that she asked about the microphone to refocus the teacher’s attention on her after the turn sharks had answered correctly the question she was unable to answer. We cannot know Angie’s intention for certain. It does appear at (33) that after the intervention by the turn sharks, Angie was trying for more interaction with the teacher.

The other two instances in which Angie tried to get the teacher’s attention are shown at the end of the full transcript. The conversation had turned to topics concerning what various children had at home: a bicycle and a pet turtle. From (47) to (61) Bobby was telling about his brother’s pet turtle. He and his account got into trouble as he revealed that the turtle could jump. At (57) Miss Wright said. “I never heard of a jumping turtle.” (This was because she operated on the principle that in
the teacher’s attention. Both times that Angie spoke, the teacher was not looking directly at Angie. At (60) the teacher was looking at Bobby, who was seated in the circle at one o’clock in relation to the teacher, while Angie was sitting at eight o’clock relative to the teacher. At (62) the teacher looked back around the circle in Angie’s direction, but only back around to about nine-thirty, not all the way around to eight o’clock, where Angie was sitting. Moreover, Angie’s comment was not at all topically relevant at either of the two times she uttered it. It is no wonder, therefore, that the teacher did not “hear” the topic and give Angie attention and a turn at speaking.

What might Angie have been trying to accomplish when she said “I can make a P” at these inappropriate moments? We can see her talk as an attempt to get the teacher’s attention after the previous debacles in which her turns at answering were taken away. We can also see her as answering another content question about letter recognition (even though it was a question unasked by the teacher). In effect, Angie may have been trying to say, “I didn’t recognize the letter ‘S’ but I do know the letter ‘P’.” In her persistent attempts to show that she knew and to try to get the teacher’s attention again, Angie may have been indicating that she did not regard the intervention of the other children during her answer turns as rescuing but rather as interference. The classroom ecology in this example of conversation thus appears to contain turn sharks rather than turn dolphins, from Angie’s point of view.

Conclusion

This has been an attempt to make visible the social interactive medium in which cognition and learning might be taking place in classroom conversation. That medium has been considered here as an ecosystem of relations of mutual influence between speakers who are also hearers and viewers. Classroom conversation is more than a dialogue or a series of successive dialogues, although there are dialogic aspects to the organization of classroom discourse. That organization involves more than just a reciprocal or sequential dimension of conversation, as well as a reciprocal one.

What appears to hold both aspects of organization together in performance is time, especially the cadential patterns produced by points of emphasis in the verbal and nonverbal behavior stream. These, I have argued, function as contextualization cues. They seem to allow participants in conversation to make kairos judgments so as to anticipate when the “next” appropriate moments for communicative action are likely to arrive. As participants orient their attention and action to a common temporal framework, their contributions in listening and speaking behavior occur together, and interaction proceeds smoothly and coherently.

In terms of the organization of discourse, we saw that the “next” organization of question-answer routines (IR and IRE sequences) appears to be strongly patterned by the cadence organization of verbal and nonverbal behavior in interaction. Crucial information items within question slots tended to occur in syllables uttered “on the beat.” Answer slots tended to be initiated (or the key word in the answer slot tended to occur) on the immediately next beat after the end of the question or on the next beat after that. Participants held each other accountable for that expectation about the timing of question and answer slots, as evidenced by the successful attempts by the turn sharks to give answers at points in time that, according to the teacher’s official designation of speaking rights to students, belonged to Angie. My purpose in the analysis of the stolen turns, as illustrated both by the transcript and by the musical notation, was to argue that if there was no regular relationship of timing between question slots and answer slots, the turn sharks would not have been able to seize the kairos moments so adeptly in taking away Angie’s turns at answering.

Angie’s lack of success in reengaging the teacher’s attention as she said “I can make a P” also shows something fundamental about the organization of interaction in classroom conversation. This involves the postural orientation and gaze of a listener in relation to the current speaker, an aspect of organization on what I have called the complementary dimension of interaction. When the teacher was facing Angie and looking directly at her, Angie was able to get the teacher to respond even if Angie’s utterance was not topically relevant (e.g., when she asked, “What’s inside this microphone?”). When the teacher’s postural focus and gaze were directed to other students, however (e.g., when Angie said, “I can make a P”), Angie’s utterances received no response from the teacher. (When the teacher looked away from Angie to the chalkboard while asking the question about the letter S, that was a different matter, for although the teacher was no longer facing or gazing at Angie, she was not facing any other student and returned her gaze to Angie almost immediately.) From such instances, we can infer that students who are successful in classroom conversation attend not only to what the teacher is saying but also to the direction of the teacher’s posture and gaze as the teacher is speaking.

In the transcripts and in the discussion of them, much was made of the organization of interaction as an environment for cognition and learn-
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Notice that at key turning points in the grammatical structure of these utterances, at differing hierarchical levels (noun phrase: verb phrase and, within the noun phrase, the noun that is the object of the verb), syntactic boundaries are marked by the prosodic cadence structure of the utterance. (This is indicated by the musical notes and by the accent marks in Figures 2.1 and 2.2.) Chomsky's insight that grammar is the foundation of the intelligibility of sentences can be amended here by saying that, in speech performance, the grammar of an utterance appears to be underscored (i.e., reinforced) by prosodic emphasis. By the co-occurring structures of syntax and prosody, the hearer's ear (and eye and mind) can be led to listen for and attend to a crucial next moment. In processing the first example, the hearer needs to know whether the question is about a letter or a monkey. What the object of the verb will be cannot be known by the interlocutor until the moment of uttering of the crucial noun (letter/monkey). That is a moment the hearer must "go for" attentionally in order to comprehend the utterance that is being heard.

Sight as well as hearing needs to be directed in focusing attention during engagement in the ZPD. If the "that" in the question "What is the name of that letter?" is a grapheme written on the chalkboard, then if a student is to understand the question, the student's gaze must be directed to the place on the chalkboard where the letter is written. (This seems so obvious as to go without saying. What is not obvious is that the gaze of the student will be directed to a particular place on the chalkboard at a particular moment in time, as was Angie's as her eyes followed the sweep of the teacher's left arm in its pointing gesture.)

In groups of interlocutors it is reasonable to assume that, if conversation is to be understood by the various participants, a temporally regulated process of "going for" certain moments attentionally must be participated in by the various auditors. Their attention needs to be focused collectively at certain moments if they are to understand what is going on. Thus the collective organization of attention would seem to be necessary for the group to learn; that is, if more than one pupil is to get the information available at a given moment, the attention of more than one pupil must get to the same moment.

Teachers who lead large-group discussions seem to sense that the collective organization of attention is important for students' understanding, as indicated by such commonly occurring directives as "I want all eyes up here." Yet our folk pedagogical understanding of attention may presume that attention is a unitary and continuous phenomenon — either
attention is there for a span of time or it is not. It may be that attention in conversation is much more labile, ebbing and flowing within a given time span.

Some research suggests that the timing, and perhaps even the cadential rhythmicity, of conversational action is important for comprehension of meaning. In prior research on gatekeeping interaction in academic advising sessions, Shultz and I studied the comments of the adviser and the student in a simulated recall session during which they viewed and commented on a videotape of the advising session. We found that when the smooth flow of cadence broke down in the conversation between adviser and student, one party or the other reported not having understood what the other party had just said or characterized what was happening in very different terms from those used by the other party. In those moments, the adviser and student appeared to have been making different kinds of sense of the same potential information in the communicative behavior that was occurring as the cadence of conversation fell apart (see Erickson & Shultz, 1982, 136–143, 191–192).

In research on classroom interaction, Kounin identified a capacity in skilled teachers that he called withitness (Kounin, 1970). This referred in part to the behavioral smoothness with which the teacher conducted classroom events. Kounin thought that the teacher's sense of timing was an important component of withitness. Teacher educators sometimes speak of this as orchestration. The use of that musical analogy may point indirectly to the rhythmicity of teacher–student interaction, since as I have argued here, it is that rhythmicity that allows the interdigitation of the actions of the various participants into a coherent collective performance.6

In research on Head Start classes, Ruiz (1971) compared fifty 1-hour videotapes from classrooms in which the teacher was experienced with fifty tapes from classrooms in which the teacher was inexperienced. What struck her as the most salient contrast across the two sets of tapes was the periodicity with which the experienced teachers moved around the classroom. These teachers moved from place to place in the classroom in rhythmically regular cycles, whereas the movement of the inexperienced teachers was much more erratic, both spatially and temporally. The phenomenon Ruiz observed may have been an index of the overall cadential regularity of the verbal and nonverbal activity of the experienced teachers.

In the literature about research on teaching, there is also a suggestive observation about interactional timing that involves classroom discourse directly. This is Rowe's observation concerning wait time, the time a teacher gives a student to answer a question (Rowe, 1974). Rowe claimed that by allowing more wait time in mathematics lessons, the intellectual quality of students' answers was improved. Yet increased wait time may seem artificial precisely because of the cadence cues for the “immediate next moment as answer slot” that we have been considering in the classroom example shown in this chapter. It is possible that more wait time might have helped Angie to formulate answers to the teacher’s known-information questions, but perhaps not. It does seem likely that increased wait time would have decreased or eliminated entirely the turn sharks' opportunities for turn seizing afforded by the “immediate next” organization we saw in the rhythmic organization of question-answer sequencing.

In our example, it seemed that even getting to the ZPD, much less doing anything cognitively stimulating in it, was a major interactional achievement. The teacher and the student had to “go for” the zone in real time, as others (notably the turn sharks) were also “going for” it. Indeed, there is no zone at all unless people construct it interactionally. “going for” crucial kairos moments both as listeners and as speakers. Unless experts and novices “go for the zone” in real time, the “zone” never happens.

One is left wondering what the temporal organization of classroom conversations might look like when what is being taught and learned is more cognitively complex than in the example given here. In fifth-grade mathematics lessons such as those reported by Lampert (1990), for example, what happens to the conversational rhythm as ideas in the discourse become more complex, or as students and the teacher shift from being more authoritative or more tentative in their presentation of new ideas? I wonder not only about what that talk is like, as various scholars are now reporting from the point of view of classroom discourse and pedagogical strategy. I also wonder about the timing of that talk.

If the timing of classroom conversation falls apart, it may be that the ZPD bursts like a bubble. How the temporal organization of classroom conversation works as a learning environment— as the locus of engagement in the ZPD—remains an issue for exploration. How the teacher and multiple learners are more or less able interactionally to engage in intellectually stimulating conversation, and how cadence and conversational rhythm may be working in the social and cognitive ecology of group learning as it takes place in classroom conversation, are issues that may well be related. Taken together they present intriguing possibilities for further research.
Notes

1 To illustrate this stream of work, a list that is representative but not exhaustive includes Brown et al. (1989), Moll (1990), Newman et al. (1989), Rogoff (1983), Tharp and Gallimore (1988), Vygotsky (1978), Wertsch (1991), and Wood et al. (1976).

2 This view is new in that it differs dramatically from the “process-product” orientation in recent research on teaching. One can argue, however, that this seemingly new view is a classic one, in the spirit of Dewey’s interactionist conception of learning, teaching, and the nature of learning environments (see, e.g., his discussion of the “total social set-up of the classroom” in Dewey, 1965, pp. 43, 45).

3 Questions to which the asker knows the answer are ubiquitous in classroom discourse, as observed by Bellack et al. (1966), Sinclair and Coulthard (1975), and Mehan (1979), among many others. The known-information question frames a power-knowledge relationship that is constitutive of the conventional classroom: that is, it presumes and manifests the belief that “There is a body of knowledge to be mastered and the teacher has mastery of it. It is that mastery which constitutes the teacher’s authority in the classroom.” How difficult it is to break this frame – to teach without invoking the existence of right answers – is attested to in current studies of attempts to “teach for understanding” (Lampert, 1990; see also Lemke, 1990).

4 Interaction in this classroom is reported in the doctoral theses of Florio (1978) and Dorr-Bremme (1982), as well as in Bremme and Erickson (1977), Shultz and Florio (1979), and Shultz, Florio, and Erickson (1982). Primary support for this work came from a junior faculty research award to Erickson from the Spencer Foundation and from a NIMH postdoctoral fellowship to Shultz. Additional support came to Florio and to Erickson from the Institute for Research on Teaching, Michigan State University, which was funded by the National Institute of Education.

5 As stated in note 3, the known-information question occurs commonly in classrooms. It may or may not occur commonly in family interactions at home. Heath has claimed that such questions were not usually asked of children in working-class African-American families that she studied (Heath, 1983). Cadzen has speculated that this may also be characteristic of working-class families more generally (Cadzen, 1988, p. 197). This seems to have been the case in Laurie’s family, which was Italian-American and working class. In two home visits we made in which interaction was videotaped from the time after school until Laurie’s bedtime. no known-answer questions were addressed to Laurie by any of the adults present – her father, mother, and her mother’s sister. It is reasonable to infer, then, that at the beginning of the school year Laurie was rather unfamiliar with known-answer question sequences as a speech genre and that her shrug was a tactical response in a situation in which she was not sure what to do. By November she had begun to answer known-answer questions, and by February she was active in doing so. But the transcribed example presented here comes from the second day of school in September.

6 Unfortunately, this analogy is partly misleading, since orchestration – the assignment of differing notes to different instruments in the orchestra by a composer or arranger – is a decision process that occurs before the performance of the music. It may be that what is meant by “orchestration” as a characterization of the teacher’s leadership of collective classroom activity is more like what a conductor does in leading the orchestra in performance. But that analogy doesn’t hold fully either, since in an orchestral performance the notes to be played by the various performers have been determined in advance. That is unlike ordinary conversation, which is a more improvisational kind of performance.

References


