

References

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Work address

DAVID PIMM

I start with the observation that the voice of the transcriber occasionally appears (between square brackets), much as director’s notes might, commenting for instance that it is now “a little while later” (line 22) or that “Abram’s hand goes up right away” (line 26). Next, the transcript has line numbers, which is one way of allowing close pointing, an asset that is insufficiently used in most articles to warrant them, as opposed to speaker turn numbers. Line numbers are a complete artifact of the transcription rather than of the speech data itself [1]. In a piece in this journal, Staats (2008), drawing on the emergent field of ethnopoetics (within linguistic anthropology), has queried whether prose (with its artificial right as well as left margin) is the most appropriate form for mathematics classroom transcription. So one possibility would be to consider re-lining the transcript to bring out some structure I might hear or see.

The things that I notice here come from a long time of looking at and reading about classroom language. My general orientation is one informed by a broad linguistics-based discourse analysis (as opposed to conversation analysis), particularised through the specific emphases and pressures that mathematics as the focus of discussion brings about. Virtually the first thing that catches my eye is the practice of students reading aloud from the text. This allows the textbook to have an actual voice in the speech environment. I ring the opening “Let’s” with a pen and expect to find first-person pronouns at work, singular and plural, although I expect their movement through the transcript may be simple, regular and stable or sometimes turbulent. “Let’s” is a veiled imperative. I also circle the opening explicit imperative “read on” (addressed, I assume, to Cory, though addressivity is one of the really hard things to garner from a transcript alone; see Pimm, Beatty & Moss, 2007, for more on addressivity). In line 13, “Cory, read on” is a more overtly addressed imperative, but in lines 26, 30 and 34 we cannot tell if the teacher’s cued elicitation of these individuals is in response to raised hands or other indicators. But imperatives, whether in a textbook or in a teacher’s words, often signal what the students are actually to do: “remember”, “read” and “look” feature highly here.

Italicising words in the transcript is a transcriber device to try to help the reader be aware of the intertextuality of the textbook in the spoken classroom discourse (for more on mathematics textbook intertext, see Dowling, 1991). The two extensive passages when Cory is reading aloud are pretty straightforward in their attribution, but what about in lines 20-21 and 23-24? I find myself wondering how the teacher, Josh, prosodically handled this revoicing intertext. Do the students hear the voice (and authority) of the textbook here, or the voice (and authority) of the teacher, to declare things as definitions?

For instance, there is language being brought in from the mathematics text and emphasised (most particularly the framing of “a straight line or a curve that shows a trend in a set of data” as a definition of “graph model”), but there is also local vocabulary being used (e.g., line 12). And the use of the word “that” which begins “That is sometimes called a line of best fit” could be *anaphoric* (referring back within the transcript) or *deictic* (pointing to the immediate context of the utterance, possibly as with the somewhat confusing “there’s” in line 19). And what are the students to make of “sometimes”?

There are also common words between text-language and classroom-language, words like “show”: the text (line 3) talks of drawing a line “to show this trend” (which I take to be a partially set phrase here, that of *showing a trend*), while Abram (line 27) offers “to show the linear relationship” and the teacher says “shows the path” (line 21) and “show the pattern” (lines 29-30). And this specific verbal choice raises an important mathematical question as to whether this thing (called “the trend”) pre-exists the use of the graph model or whether it is actually created (called into being) as a result of the model being applied. “Show” suggests the former, more passive interpretation.

The question of pronoun reference is interesting: there are teacher “I’s (e.g., line 25, but also 29) as well as “we’s (e.g., line 12) and teacher “you’s (e.g., lines 11, 32 and 34). I have lots of questions about these pronouns. To talk of “your vocabulary words” (line 20), when there is also a certain amount of “we”-speak is arguably contrastive, explicitly excluding the teacher. However, when and why in line 33 does it suddenly become “your definition” that the teacher is directing them to in the funnel of imperative and interrogative cues in lines 32-35? Is it because the teacher cannot claim it as “ours” when it has evidently come from the book, peopled by “them”? Yet to call it “their definition” might be too distancing. How does this relate to Christy’s use of “you” in her response (line 31)?

A sophisticated reader can pick up the intent of the text sentence at line 15 beginning “Once you fit ...”, but the ambiguous use of “you” (for “one”) might conceal that this use is general and that what you can use it for is its purpose. Here, the teacher repeats his question three times and hedges his way out of having to accept either Abram’s or Christy’s responses. (In passing, note the infinitive form of these responses in lines 27 and 31, the presumed head of the sentence being “The purpose of a graph model is ...”) Also notice the explicit use of elements from the mathematics register in Abram’s response, compared with the more colloquial response of Christy, who also substituted the lexical item “tell” for “show”. And the teacher uses the word “just” in each case to identify the insufficiency, a trigger word for some students (see Wagner & Herbel-Eisenmann, 2008). There is much of interest here.

Note

[1] There are more significant issues concerning the transformation of speech into writing, including orthography, dialectal issues and, for mathematics specifically, notation: for example, no one ever says “2”, he or she always says “two”: unlike with writing, we always *speak* English (or whichever language) words.

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Language in use

LESLEY REX

As I read through the transcript, I am most interested in understanding the social and epistemic culture of the classroom this text represents (Rex, 2006). I view the discourse described as language-in-use and seek to make visible how the linguistic and discourse choices of classroom interactants are consequential for student learning (Rex & Green, 2008). Although this transcript offers only a momentary temporal snapshot of the classroom’s lifeworld, it can tell me a great deal about how knowledge-related actions are connected to the social roles and relations that the teacher and students are constructing as they interact (Erickson, 2004; Streeck & Mehus, 2005). Through conversation analysis, I can observe in adjacency pairing: a) how utterances meaningfully position what counts as knowledge and how to display it; b) whose knowledge and moves count in determining the content and direction of the interactions; c) where authority for mathematical knowledge resides and who has the right to broker that knowledge; d) how teachers, through their discursive styles, sustain knowledge-building practices that may clash with or enact the aims of their curriculum.

In the textbook, students read the results of a second-hand investigation and compare it with the results of their own investigation. (“J: Okay, first of all look at their class average and then look at our class average. How do they compare? Cory: Theirs is like heavier or something.”)

Cory provides a comparison; the teacher, Josh, acknowledges (“Okay”) and validates Cory’s answer by providing evidence for his interpretation. In response, students conjecture as to why the Maryland bridge required more pennies. Another student’s first utterance is inaudible, but Josh’s response (“Maybe. Maybe it was thicker”) suggests he had conjectured that the differences in data measures had to do with differences in thickness of the paper used to make the bridge.

I will leave to my mathematical colleagues the question of whether the unnamed student’s response could be considered a thoughtful and substantive conjecture. Instead, I am interested in how the teacher responds. Even without knowing the tone of Josh’s response, his words appear to redirect attention away from S and her conjecture to Josh himself and, by extension, to the textbook. He says he does not know whether in Maryland they used construction paper or a similar heavyweight paper. When a student responds with another observation, Josh ignores it and redirects the class by asking Cory to read on. The implication is that S’s idea, and the direction for answering the question in which she is taking the class, is not worth pursuing.

After Cory has read from the text, the teacher re-reads a sentence. He tells the students where to focus in the Maryland data and how to understand it, before asking Cory to read on. Again, he points to a sentence in the text, noting its importance as a “good definition” and remarks that he will post a vocabulary wall chart. These multiple language forms mark this information as important. They add to the moves the teacher has already made to indicate that text-based data and definitions constitute the mathematical knowledge that matters. Also, by repeating verbatim the definition of a graph model, by audibly planning to post the word and definition on the wall, and by holding students accountable for this vocabulary word, the teacher reifies the abstract concept of “graph model”. He is treating a conceptual definition as a real, tangible object, as though the definition *is* the knowledge. The teacher reinforces this epistemology later in the lesson episode, when he asks the class to “remember what a graph model *is*” and restates the definition from the text.

This episode also can be read as indicating where students are directed to look to locate mathematical knowledge. Looking in the book is communicated as insufficient. Later in the sequence, after pointing out that all their graphed data points “are pretty close”, the teacher asks, “Why do we do this? What’s the purpose of a graph model?” I am interested in his use of “we” in this first question. To whom is he referring? The subsequent interactions point to another focus. The teacher, through his questions and responses, is asking students to figure out *his* answer to the question. Abram makes the first attempt with, “To show the linear relationship,” which the teacher greets with a “yes, but” type of response. Yes, maybe the graph model shows linearity, but that is not what Josh is looking for. His next question tells students it is his reasoning he wants them to understand: “Why did I draw the line?”

Christy’s response is met with, “Well, maybe that’s part of it,” before Josh refers the class back to the specific definition for a graph model in the book, whereupon he makes another attempt to elicit the answer he is looking for by asking Lance directly, “What’s the purpose here?” Again Josh invokes “we”, collapsing the *I* and *we* positions. Why did *I* do something is interrelated with why do *we* ever bother doing this? This move not only reinforces the textbook as the site of sanctioned mathematical knowledge, but it also confirms the teacher as the interpreter of that knowledge in this classroom. In doing so, this move positions both the teacher’s role and what students should expect of him and of themselves. Students are to be readers of the teacher’s actions and