

## Mathematics Teaching: Moving from Telling to Listening

Brent A. Davis

---

The senses are not only the basis for the epistemological constitution of reality, but also for its transformation, its subversion in the interest of liberation.

Marcuse (1972, p. 71)

Vision is a spectator; hearing is a participation.

Dewey (1927, pp. 218 - 219)

[The] development of our capacity for listening is a meaningful way of reclaiming alienated meaning and assuming response-ability for the future.

Levin (1989, p. 8)

### *Visiting a Grade 7 mathematics classroom*

Tom wanders among his grade 7 mathematics students as they “play” with their *Fraction Kits*, sheets of paper cut into halves, thirds, fourths, and other fractional pieces. He has posed a question to the class that was raised by a student in a previous lesson: Using the pieces from the kits, how many different ways can you make three fourths?

The class members are noisy and active. Groups are huddled together, producing five, six, nine, eleven answers. As Tom moves about the room, he listens, he asks more questions, he requests that students display their work on the chalkboard.

Not everyone is finished when he calls them to attention, but they listen eagerly, knowing that they will soon have an opportunity to tell their classmates what they have done or discovered. A lively discussion of the activity ensues, during which Tanya asks, “How many different ways are there?”

“I don’t know,” Tom replies honestly. “I’m not sure anyone knows. It’s possible that no one has ever asked that question. Let’s see if we can find an answer.”

The activity with the Fraction Kits resumes, groups excitedly attempting to find not just some, but ALL of the answers to the original question.

Nearing the end of the class, Tom calls for the students’ attention, and then asks Leanne to tell the rest of the class about the method she is using to record her answers. Leanne describes the table she has devised and attempts to explain the

logic behind its structure and its use. As she does so, Tom asks questions, in part for further clarification, in part to aid her explanation.

In the final moments, Tom asks students to arrange their answers in a similar table. They commence earnestly. Just before the bell, he suggests that they attempt to complete the question for homework. That will be the starting point for tomorrow's class.

Sitting in on this lesson as an experienced mathematics teacher, I couldn't help but be amazed. As I listened, I heard references to addition, subtraction, multiplication, and equivalence concepts—all at a level of complexity far surpassing the recommendations laid out in the mandated curriculum documents. But what was more surprising was that Tom did not seem to be saying much at all. He wasn't teaching by *telling*, rather he seemed to be teaching by *listening*.

In this paper, I seek out what it might mean to "teach through listening," attempting first to come to an understanding of the nature of *listening* before exploring its place in the mathematics classroom.

### *Looking for listening*

Across the noisy classroom, I watch Tom as he moves from group to group. At first, he stands apart from a cluster of students, attending silently to their interactions. He leans toward them, his eyes not only on their faces but on the movements of their hands and on the products of their explorations. Then he moves closer, his interest piqued by a spoken comment or a silent action.

Without being able to hear what is being said, I can tell that Tom is listening. There is a particular bodily aspect to listening, a visible orienting to the subject of discussion. When two persons converse, for example, it can be *seen* that they are listening to one other as the actions of their bodies become bodily *interactions*. They lean into and reach out for one another, momentarily unaware that they are violating the Western taboos on proximity, touch, and extended eye contact. They seem to focus in a way that suggests they are oblivious to the noise around them; they attend to each word and to each action as though nothing of importance had occurred prior to the discussion and nothing of importance awaits them at its end. They are unconcerned that their voices are perhaps too loud, that their bodies are too animated.

Listening, then, need be neither motionless nor silent—although, more often than not it seems, it is precisely this sort of inactive attention that is demanded of students by teachers. Of course, the listener may assume this pose, but it is something other than an audience's lack of motion or their silence that makes us aware that they are listening. In the classroom, for example, as the novel is read or as the mathematical principle emerges, the teacher knows the students are listening not because they have ceased to move but because a certain rhythm or harmony is established—there is an awareness that each is immersed in and conducted by the same subject matter. The gazes are fixed not on the teacher nor on one another, but on that which is among them.

An important quality of this listening, then, is that it be active, and an immediate implication is that listening cannot be held silent. As Tom listens in on a group, he questions, he challenges, he smiles, he frowns. His actions convey not only that he is listening, but that he is learning from the interaction.

Similarly, during a classroom discussion, his methods of questioning indicate a sincere underlying desire to hear the answers that might be given. The questions are not pre-selected, nor does he know the responses. "Tell me how you got that answer." "That's an interesting statement. Can you tell me more?" These are of a different sort than the questions we normally associate with mathematics classes—that is, questions for which the answers are already known, questions whose answers have little or no effect on subsequent inquiries.

These points become clearer as we compare Tom's classroom with a more conventional mathematics lesson.

### *Listening in a traditional classroom*

The bell rings and Wendy moves to the front of the room. Above the students' chatter we hear her voice: "ONE... TWO . . ." The class falls silent before she reaches three. Wendy waits a few more seconds until everyone is seated properly in their desks.

"Take out your homework and pass it to the person in front of you." There follow five minutes of calling out answers, moving from student by student, up and down the straight rows. The exercises are corrected, the scores are tallied, the numbers are recorded.

"Okay, we're moving on to multiplying fractions today. Before we get started I want to emphasize that the way you multiply fractions is totally different from the way that you add fractions, so don't confuse the two."

A ten-minute "lesson" ensues in which the multiplication algorithm is presented along with a variety of examples. As the lesson moves along, students are given a few "Do Now" exercises and, after a moment of hasty computation, are asked to give their answers. Notes are written on the board and copied into workbooks. The students ask few questions.

The assignment—a textbook exercise—is then identified and students are given the balance of the class for independent work. During this time, Wendy moves from raised hand to raised hand—confirming answers, pointing out errors, and repeating fragments of her earlier explanation. A reminder that the "rest of the page" is to be completed for homework is given as the bell rings to end the class.

The precise details of this account are specific to this one classroom on this particular day, but there seems to be a broad familiarity to this lesson. This is a "typical" mathematics class—ordered, structured, calculated, predictable—reflecting a particular and pervasive conception of the discipline.

But it is not the greater emphasis on order and structure that most strongly distinguishes Wendy's classroom from Tom's, it is the nature of the communication that occurs among the members of the two communities. Unlike the previous classroom, here there seems to be almost no *interaction*. The actions of the students and the teacher appear to be coordinated, but independent; they lack a common rhythm. There is a clear sense that Wendy has taught this lesson before and will teach it again. The particular students in the class have little effect on the lesson's course. Their backgrounds, their varied interpretations are unimportant. The "correct understanding," one that is independent of them, is presented for mastery.<sup>1</sup>

The mathematics in Wendy's classroom is thus an object that stands between the teacher and the learners. It is a collection of ideas that are separate from their experiences in the world, but which are imposed onto those experiences. It is knowledge developed elsewhere and re-told in this setting. It is an object that does not facilitate their relationships, but holds them apart. In this classroom, the teaching might be best characterized as an act of *telling* that demands little *listening*.

### *What is listening?*

A potentially useful comparison to make between the sorts of interactions that are prevalent in Tom's class and the patterns of communication that characterize Wendy's is to suggest that the former context is more conversational and the latter is more monological. As Taylor (1989) explains, conversations

move beyond mere coordination and have a common rhythm. The interlocutor not only listens but participates with head nodding and "unh-hunh" and the like, and at a certain point the "semantic turn" passes over to the other by a common movement. The appropriate moment is felt by both partners together in virtue of the common rhythm. (p. 310)

Taylor contrasts such "dialogical acts" with "monological acts"—acts of a single agent—a notion which seems to be more applicable to Wendy's classroom.

The conversation is a fertile place to search for an understanding of the nature of listening. Gadamer's (1990) description of the conversational relation seems particularly apt for interpreting the interactions in Tom's classroom.<sup>2</sup> In Gadamer's formulation, the conversation is a triad involving you, me, and the topic or subject matter. The subject matter exists only in the conversation—neither in you nor in me, but between us—and we are "conducted" by it.

---

<sup>1</sup> This is not to suggest that Wendy's students are not interested in the subject matter. Many are. But it is a different sort of engagement, as suggested by the sorts of questions that are asked by teacher and students alike: "What is the product of three fifths and one half?" "How do you do number four?" These are not questions that are oriented toward developing a deeper understanding of the concepts, nor do they suggest personal and meaningful relationships between learner and subject matter or among learners within the classroom context.

<sup>2</sup> In making this comparison, I do not mean to suggest that the mathematics classroom can or should be patterned after the conversation. It cannot be. As Gadamer suggests, "we fall into" a conversation which "reaches its own conclusions." In contrast, we are thrust into the mathematics classroom and, once there, the subject matter and the "anticipated outcomes" are determined for us for the most part.

Through the conversation we attempt to incorporate the insights of the other, moving toward a consensus or “fusing of horizons” (p. 387).

And so the communicative relationship is an intimate one, an idea echoed by Merleau-Ponty (1962) who suggests that human interaction involves a merging or an intercorporeality.

[As I listen to another, my body] discovers in that other body a miraculous prolongation of my intentions, a familiar way of dealing with the world. Henceforth, as the parts of my body together comprise a system, so my body and the other person's are one whole, two sides of one and the same phenomenon, and the anonymous existence of which my body is the ever-renewed trace henceforth inhabits both bodies simultaneously. (p. 354)

We are thus *joined* in the conversation, a theme that is common in Merleau-Ponty's writings. Elsewhere, for example, he describes a of the communicative act as “one system with two terms (my behavior and the other's behavior) which function as a whole” (1964, p. 118). Husserl, Merleau-Ponty tells us, described such coordinated action as a “phenomenon of ‘coupling’” where the notion of ‘coupling’ is “anything but a metaphor.” Merleau-Ponty goes on to explain that it is our ability to perceive—to observe, to hear, to sense—the other that enables this phenomenon: “In perceiving the other, my body and his are coupled, resulting in a sort of action which pairs them (*action à deux*)” (p. 118). Complementing Gadamer, then, Merleau-Ponty would agree that, in conversation, we set aside our illusions of autonomy, allowing a collective consciousness to emerge; in this conversational unity, we become capable of greater insight and deeper understanding, capable even of cutting beneath the conscious intent of the speaker.

The goal of the conversation is to deepen understanding. It “has a hermeneutic thrust: it is oriented to sense-making and interpreting of the notion that drives or stimulates the conversation.” (van Manen, 1990, p. 98). The key to such sense-making, that which enables the interpretation, is listening, itself hermeneutic. It is our ability to listen—that is, our ability to attend to and to interpret what is said—that makes conversation possible. Hear Levin (1989) on this issue:

When listening really echoes and resonates, when it allows the communication to reverberate between the communicants, and to constitute, there, a space free of pressure and constraint, it actively contributes, quite apart from the speaking, to the intersubjective constellation of new meanings, meanings actually born within this intercorporeality; and it promises, because of this, the achievement of mutual understanding—if not also consensus. (p. 181)

### *Listening is not a technique.*

What he'd told her... was valuable if she'd been listening. But she wasn't. She wasn't a listener. She had a set of fixed static patterns of value and if you argued with her, she'd get mad at you. (Pirsig, 1991, p. 158)

This is how Robert Pirsig describes the title character in his book, *Lila: An Inquiry Into Morals*.

The statement “She wasn’t a listener” is immediately comprehensible. In so describing Lila, Pirsig is suggesting not that she was incapable of hearing, but that she was not normally open to others and to their ideas, limited by her “fixed static patterns.” Listening thus is not primarily an act, it is an orientation. Everyone is capable of listening, but few, it seems, are in the world in a listening way. Listening, then, is a way of being in the world, an “*ontologically orientated capacity*” (Levin, 1989, p. 17) that is directed toward bringing ourselves and others into being.

We are all acquainted with people who are not listeners. When we talk with them, they might ask the correct sorts of questions and perhaps even display the appropriate mannerisms, but our contributions either seem to be ignored or misinterpreted. We get an uneasy feeling because, even though we find ourselves within the interaction, it does not seem that we are part of it. We feel rushed, unheard, not listened to, excluded—not present. We quickly become unwilling to “share” even the most mundane thoughts. Sadly, it seems that many mathematics teachers, when they are in their classrooms, fall into this category.

And so listening is not a technique that can be reduced to a set of prescriptions or guidelines. It is something that we enter into, something that we are, emerging from our occupation with others and with their meanings. In this way, listening has much in common with “attention.” As described by van Lennep (1969), “attention is the manner in which we relate ourselves to the things on the basis of the meaning they have for us.... Attention is a form of ‘pregnant’ contact. Thus we can never separate attention from our being occupied with the things and from the meaning within our field of action” (p. 219). So it is with listening.

Further, we listen not just with our ears and minds, we listen with our bodies. Listening is an activity of all of the senses, attuned not only to the text of the conversation, but to the subtexts (the tones, the mannerisms) and to the contexts (the setting, the history). It is not strictly or even primarily an academic or intellectual activity, it is a fully human endeavor that also evokes physical and emotional responses. As Merleau-Ponty (1962) suggests, “I echo the vibration of the sound with my whole sensory being” (p. 234). We listen with our ears, with our eyes, with our touch, with our stomachs, with our bodies, bringing the collected weight of our experience to our emerging understandings.

### *Listening is not the same as hearing.*

Part of my research has involved making audio-recordings of classrooms. Each time I sit to transcribe the teacher-student interactions from one of these recorded lessons, I am struck by the muddle of sounds that the machine has captured. There are rustling papers, falling pens, and textbook covers slapping against desk tops. There are whispers, sighs, and laughter. But when I was there, I was unaware of this hum of the classroom. I quite simply did not hear these sounds.

I am able to induce the same phenomenon at this moment as I pause from my writing to listen, becoming once again aware of the sounds in which I am immersed. It seems that only when my attention is drawn or directed to particular sounds—like the rumbling of traffic outside my window—that I am able to hear them.

*Hearing* and *listening* then refer to different phenomena. Consider, for example, the difference between the two statements: “I can’t *hear*” and “I can’t *listen*.” In the former, I seem to be

concerned that the sound isn't loud enough. It is something that I say when I want to hear but, for whatever reason, cannot. The concern is strictly sensory.

In the latter, however, it is clear that *I am able* to hear the sound without difficulty. In uttering, "I can't listen," I'm not saying that I *can't* hear but that I *won't* hear. To make this point clearer, the statement, "I can't hear" is often followed with "Turn *up* the volume." But the statement "I can't listen" tends to be accompanied by sentences more along the line of "Turn *down* the volume." *Listening* is thus a capacity which is based upon *hearing* but which goes beyond *hearing*. It is intentional (we listen *to* something) and attentive (we listen *for* something). Hearing, in contrast, lacks such intentionality.

A comparison to *seeing* and *looking* might be helpful here. *Sight* is the sensory capacity; *looking* is the intentional act through which we bring closer (bring forward) particular "objects." *Hearing* and *seeing*, the sensory capacities, present us only with an undifferentiated background. It is our ability to *listen* and to *look*—that is, to draw something out of that background of experience, to focus on it, and to bring it into ourselves—that enables our perceptions.

The first distinction between hearing and listening is thus made. Hearing is the sensory capacity that underlies our ability to listen. In the classroom, what I heard was determined mostly by what I was listening for. I heard the teacher's questions, I heard the students' answers. I heard the range of pitch and tone in their voices. In one sense, I heard everything, because I was aware of no gaps in my perception; the experience was seamless. But, in truth, I heard hardly anything.<sup>3</sup>

And so hearing is merely *sensory*, an awareness of sounds; it is not concerned with interpretation although it is constrained by our abilities to interpret and to notice. In contrast to the passive sensorial nature of hearing, listening is *sensual*: active, focusing on, welcoming in, and attending to these sounds with a hermeneutic interest. Interestingly, the *Oxford English Dictionary* notes that listening is etymologically related to *lust*, suggesting focused longing, sensual physical contact, and intimate pleasure.

There is a second important distinction to be made between hearing and listening that is suggested by the phrases, "I hear you" and "I'm listening." At a recent parent's meeting, for example, a school principal responded to each of the parent's concerns with "I hear you." But it did not take long for every parent to realize she was not listening. In uttering "I hear you," she was suggesting that she understood what was being said, that the speakers' meanings were apparent to her, and that there was no need for further listening. Hearing, then, presumes understanding, and when we cannot comprehend someone, "we can't hear a word he's saying."

---

<sup>3</sup> It is not quite correct to say that our ability to hear is dependent upon our listening. Although what we listen for (what we are anticipating) affects what we hear, there are many sounds which are still heard even though they could never be anticipated. Once aware of these sounds, we can choose to listen—that is, to attend more closely and seek to understand—but, until our attention is taken up elsewhere, we cannot choose to not hear. And there are other sounds—those we tend to refer to as "noise"—like the sound of the unmuffled motor in the middle of the night, that thrust themselves into the centre of consciousness in a way that collapses listening into hearing. We are coerced into attending to these noises, and we feel violated in this coercion.

In contrast, the statement “I’m listening” suggests a recognition of the preeminent role of interpretation in our interactions. It is when our understandings are incomplete that we are compelled to listen. Indeed, when someone challenges or fails to grasp the point we are attempting to communicate, we do not respond with, “There is a problem with your hearing,” but by saying, “You’re not listening.” This distinction is an important one because much of the interaction that occurs within the classroom, it seems, is based on hearing rather than on listening—that is, on an awareness of the other’s presence, but not on an earnest desire to bring them forward; on knowing, but not on understanding.

### **Listening to—*There is an object to our listening.***

As suggested above, listening, like looking, is intentional. It is directed toward a particular object—that is, toward bringing it forth out of an undifferentiated background of experience. In listening, I am drawing an object into myself, the subject, and so we are brought forth together; we are intertwined in our being and our becoming. Thus, an orientation to listening brings with it an awareness that there can be no rigid subject-object split.

But what is the nature of this object of attention in the mathematics classroom? At first, there is a temptation to suggest that the object must be the speaker or student. There is also a compulsion to suggest that it must be the mathematical concept under study. Arguably, our proclivity to answer in these terms betrays persistent Cartesian perspectives on subjectivity and knowledge, perspectives that are challenged by Gadamer’s and Merleau-Ponty’s descriptions of the communicative relationship.

We might be able to develop a sense of the object of listening by comparing the approaches to the study of mathematics that were enacted in the two classrooms introduced at the start of this paper. In Wendy’s, the lesson began with an introduction of the formal mathematical concept, presented in a manner that might be interpreted as suggesting that the “multiplication of fractions” concept had an existence independent of human experience—that it was a pre-existing object that was discovered in the Real world, rather than a uniquely human notion that was developed for the purpose of rendering diverse experience meaningful. Following its introduction, it was applied to a few situations that may or may not have been familiar to learners. Exercises were then assigned to ensure mastery of the procedure.

This sequence was reversed in Tom’s classroom. The lesson began with exploration and manipulation—the development of a repertoire of common experience—which could then be talked about in a meaningful way using familiar terms.<sup>4</sup> The discussions were, for the most part, informal. Where formal symbols and operations were used, they were not as the end products of the learning. Rather, they were employed as a means of facilitating interaction and

---

<sup>4</sup> It is important to note that the concept being covered in the class is one that might be described as being only a single step away from immediate experience. Steiner (1962) offers a useful distinction between these sorts of concepts and others that were developed around the time of Isaac Newton through a turning of mathematical processes onto mathematical objects, producing a sort of concept that was no longer interpretable in everyday language or on the basis of common experience. These are the concepts found in higher courses of study. In spite of the difference in levels of abstraction, however, I believe that the approach to study need not be different.

enabling further exploration. Mathematics, thus enacted, was understood to be more an approach to knowing than a body of established knowledge.

The object of the listening is thus the emerging knowledge—the individual’s conceptualizations and the collective realizations—where the mathematics is not (and can not) be considered apart from the mathematizers. The curriculum thus merges with and emerges from experience. The notion of curriculum then involves more than the study of particular ideas, it becomes an integral and integrated part of the constantly emerging text of our existence as enacted in the relationships of the classroom. Issues of knowledge and understanding are thus woven into and cannot be considered apart from the notion of identity.

But what of the mandated curriculum and the accepted body of mathematical knowledge? How does one reconcile the demands of a course outline through this “casual” exploration? It would be misleading to suggest there are no tensions between Tom’s approach to mathematics and the sequences, structures, and facts outlined in a program of studies. The latter is inevitably interpreted as “target” knowledge that can be evaluated on a standard examination. But, in Tom’s class, the curriculum objectives became procedural knowledge. As noted in the account that opened the paper, students were making use of concepts with tremendous facility—not because the classroom experiences were targeting these concepts, but because these concepts were derived from experiences. Stated otherwise, the mathematical ideas became a means to an end, not an end unto themselves.

### **Listening for—*There are constraints on our listening.***

The *listening to* that occurs in a social situation is a complex phenomenon because we are dealing with persons who are never merely individuals, “they are always also representatives of institutional power, bringing with them a multiplicity of vested interests—and many virtually inaudible agendas” (Levin, p. 111). Each of us carries with us not only the history of our personal experiences, but the accumulated experience of the culture in which we are embedded. These experiences simultaneously enable and impair our listening, at the same time facilitating interpretation and limiting the possibilities for that interpretation.<sup>5</sup>

Thus, as we are *listening to*, we must also be *listening from*—that is, we inevitably take a particular stance in our listening. This idea is more commonly (and perhaps more clearly) indicated by the phrase “listening for” which hints at the inevitability of approaching interactions with a particular set of expectations or biases. *Listening for/from* is quickly revealed when my background differs markedly from the person’s with whom I am in conversation. In the extreme case, when languages differ, listening is reduced to attempts to interpret simple signals. But conflicting interpretive frames present even more imposing barriers to listening as

---

<sup>5</sup> Both philosophers and scientists have elaborated upon this point. Gadamer (1990), for example, talks about the “prejudices” we inevitably bring to our listening and observing. Varela et al. (1991) summarize some provocative research in which it was demonstrated that, when presented with a stimulus, there is a far stronger correlation between activity in the sensory organ and the activity in the brain than there is between the qualities of the stimulus and activity in the sensory organ. In effect, this result demonstrates that my perception of an object is more the product of what I have “projected” or anticipated than what was actually “sensed.” To *listen*, then, is to subject our perceptions to scrutiny, endeavoring to disrupt the “taken for granted” which precedes, constrains, and (in effect) determines those perceptions.

they bring about a reluctance to adopt the other's stance. Similarly, if the subject matter is not something that commands my interest, my listening becomes labored, more easily distracted, and sometimes resentful. This phenomenon is evidenced in countless mathematics classes, and its pervasiveness suggests a need for developing some common repertoire of experience and language which can facilitate interactions. This was the purpose of the paper manipulating activities in Tom's class. On the surface, these were simple, and perhaps even mundane, exercises. But there is no disputing that the students were able to develop complex and sophisticated mathematical understandings, largely as a result of their "playing" with and talking about these materials.

Because listening is interpretive, what one is able to hear (understand) is also largely dependent upon the context in which the listening occurs. The context provides us with clues to interpret the words and the actions of the speaker. It is thus that the same statement made in a different setting can take on a new meanings, or perhaps lose meaning entirely.

Often, inappropriate interpretations do not result from one's inability to listen, but from a failure to attend to these contextual cues. Such "breakdowns" are not infrequent in mathematics classrooms, prone as they are to using familiar terms in unfamiliar and unusually precise ways. Further, because mathematical knowledge is popularly believed to be independent of context, a concerted effort is often needed to attend to the particularities of given situations that may affect learners' conceptualizations.

So our listening is affected by the way that we are socially and physically situated in relation to one another. Thus I do not listen to my friends in the same way that I listen to my colleagues, and I listen to children differently than I do adults. These differences in listening are not strictly a consequence of the topics that we discuss, the contexts of our conversations, or the unstated rules that govern our interactions. Rather, the type of listening seems primarily determined by the nature of the relationship—in effect, enabled by who we are *listening to*, and constrained by what we are *listening for*.

Thus, in order to explore the ways in which mathematics teachers do or might listen, it is important to consider the nature of the teacher-student relationship and the context in which this relationship occurs.

*The pedagogical relationship involves a particular sort of listening.*

A colleague recently interviewed a number of high school English students about a unit of study they had just completed. Although he never intended it to be a central issue, the topic of these discussions inevitably turned to their teacher. Asked what it was that distinguished her from their others, most students responded immediately that it had to do with the way she listened.

How did she listen? Perhaps Levin (1989) can help us:

In listening to others, accepting them in their irreducible difference, we help them listen to themselves, to heed the speech of their own body of experience, and to become, each one, the human being he or she most deeply wants to be. (p. 88)

A similar sense is captured by the notion of "pedagogy" as elaborated by van Manen (1991):

Pedagogy refers only to those types of actions and interactions intentionally (though not always deliberately or consciously) engaged in by an adult and a child, directed toward the child's positive being and becoming. (p. 18)

Further,

In pedagogical situations the adult and the child do not just happen to be in the same spot; rather, they are together in a special way. They are together in an interactive unity that constitutes a relation, a pedagogical relation. (pp. 72-73)

It is not my purpose here to attempt an explication of "pedagogical listening." Van Manen, Bollnow, and others have already explored this issue through their studies of pedagogy. The essential point to be made here is that the adult's pedagogical relationship with the child has a particular form which calls us to attend. Perhaps a discussion of the virtues associated with listening might help to clarify this idea.

*The ability to listen is dependent upon the presence of particular virtues*

She was easier to talk to, too; she did not have a somewhat damping manner of listening only to correct. (Wyndham, 1955, p. 69)

If we hold the learning of mathematics to be a process of mastering pre-established and universal truths, then the purpose of listening to learners would be to diagnose and to remediate difficulties—the teacher would "have a somewhat damping manner of listening only to correct." Indeed, altogether too often it seems that, if the teacher listens at all in a mathematics classroom, it is in this manner.

But if we hold that the learning of mathematics involves something other than the acquisition of knowledge, then listening takes on quite a different relevance. We become interested in student interpretations of ideas and we are more aware of how these interpretations are tangled in the web of their existences. Thus our listening becomes a truly hermeneutic activity, one that requires the virtues of openness, humility, caution, and trust.

The listener must always be oriented toward gaining a fuller understanding, always vigilant to the fallibility of interpretation. This is why listening cannot be silent; it is itself a kind of speaking, a means of probing and checking emerging understandings. In Gadamer's terms, one "tests" or "questions," "one does not try to argue the other person down but... one really considers the weight of the other's opinion" (p. 367). Within the conversation, this manner of "speakingly-listening" is expected. Indeed, we can only know if the other is listening if she responds in some way, and so we worry she is daydreaming or lost when she falls silent. So listening is not a solitary act, it is a reciprocal engagement.

The ability to listen is also dependent upon a certain trust that the speaker has something to say. Comparing Tom's and Wendy's classes once again, it would appear that Wendy has little faith that students will have much to offer the lesson, whereas Tom endeavors to develop the interactions around student contributions. This attitude of trust extends to include a belief that the learner is justified in what he is doing or saying, that there is *reason* (whether mathematical or otherwise) in his actions. If the teacher lacks this trust, then the temptation will be merely to

correct, forcing the learner to suppress the thought, belief, or intuition that lay beneath the original “error.”

The converse to this notion is also true. The student must trust that the teacher or fellow learner is willing and able to listen before investing much effort in articulating certain ideas or presenting as yet unproven ideas. This is an ability that can be developed, in part through accumulated teaching experience, in part through attempting to anticipate possible student responses. In any given context, we are compelled to listen *for* certain things. Stated otherwise, we cannot avoid bringing particular expectations to our teaching—and hence to our listening—and it is thus the process of thinking through possibilities can open one’s hearing.

*The current context does not facilitate listening.*

In the discourse surrounding mathematics education, there is an alarming absence of reference to the pedagogic nature of the relationships between teachers and students. Somehow we have forgotten that all “our pedagogical being with children is a form of speaking with them” (van Manen, 1991, p. 31), in favor of a conception that, at times, seems more consistent with speaking *at* them.

This very notion was confirmed in a mathematics curriculum and instruction course that I took some time ago. Midway through the term, the professor asked the participants, all of whom were practicing teachers, to “listen” to their students for one week and to bring some examples of what they had heard to the next class. They returned the following week with comments like, “I listened but couldn’t pick anything out,” and “My lessons just weren’t conducive to doing that sort of thing this week.” It appears that these teachers perceived no need at all to listen.

This inability to conceive of a mathematics classroom as a place for listening is not limited to the participants in this course. My non-teaching friends usually react with laughter when I raise the issue of how mathematics teachers listen. Consistent with the above story, teaching in general, and mathematics teaching in particular, is seen to be about *not* listening. What is it about the mathematics classroom, or our histories with mathematics teachers, that brings about this reaction?

An answer to this question is not difficult to find. If Wendy were asked to report on her listening during the lesson described, she would likely respond, like the teachers in the curriculum course, that her lesson just was “not conducive to doing that sort of thing.”

What are the implications of this orientation with regard to the relationships between teacher and student in Wendy’s classroom? We cannot suggest that she lacks a pedagogical concern for her students. Indeed, in discussing her approach to teaching, she suggests that it emerges out of just such a concern. But the approach to learning and knowing seems painfully unpedagogical. There is no sense of individual difference, of historicity. There is no awareness of inter-corporeality or even of mutual affect. Indeed, it appears that the dominant perception is quite the opposite: separated, autonomous, insulated beings that do not affect and who are unaffected by those around them and by the subject matter that brings them together. These relationships appear not only to lack meaning, they seem demeaning.

In particular, it is clear that the subject matter in this context is not something that enables relationships; rather, the pedagogic relationship between teacher and students exists *in spite* of the mathematics, a problem exacerbated by the particular culture of the mathematics classroom. The mathematics teacher has been charged with imparting information, a task which would appear, at first glance, to obviate the need for listening. As noted in Wendy's case, it has led to a sort of teaching that might be best characterized as *telling*, in turn leading to types of interactions that require *hearing* but little *listening* on the parts of teacher and students alike.

This point becomes clearer as we return to the comparison of this mathematics lesson and a conversation. An important distinction between the two situations can be made through examining their uses of the terms "questioning" and "testing." Recall that Gadamer made use of these terms when describing the sort of probing that is necessary when one is seeking a deeper understanding within a conversation. For him, questioning and testing have a hermeneutic intent and they thus facilitate listening. Such is not the case in this mathematics classroom where questioning tends to be interpreted as the elicitation of rote responses and where testing has become strictly a means of converting mathematical understandings into a summative grade. The teacher is not genuinely attending to the answers given in a way that helps her to understand the sense the children are making; neither do the students' answers generally affect the course of the lesson. In this mathematics classroom, rather than facilitating listening, questioning and testing have become substitutes for listening.

There are other factors that militate against listening in the mathematics classroom: the desks are arranged for quiet individual work, intended to distance rather than to foster relationships; the prescribed topics are often of little interest, not the sort that "conduct" participants; the mathematics concepts presented are rigid and defined, offering little space for personal negotiation. Further, in the current context, the teacher is placed in a position of authority, expected to "control" learners and to demonstrate her expertise in the discipline. The metaphors guiding this interaction, which tend to be management- and mechanically-oriented, have a profound constraining effect on listening.

But, to leave the discussion here would be to suggest that it is not possible to transcend these constraints. As demonstrated by Tom, other patterns of interaction are possible, if more difficult to enact in the current context. In particular, an orientation toward listening, supported by and bringing with it a sense of pedagogy, suggests a promising alternative.

*Listening is a fundamental competency of the mathematics teacher.*

The question of how teachers listen is not an easy one to answer because it is dependent upon a form a research that is itself an act of listening. Arguably, this question is not the important one to be asking, concerned as it is with what exists and not with what might be. It loses sight of the transformative potential of a listening orientation. Further, in the process of listening for listening, one runs the risk of neglecting that which precedes and enables it.

It would thus be misleading and reductionist to suggest that the underlying difference between Tom's and a more conventional classroom has to do with his orientation to listening. His sense of pedagogy, his views on the nature of mathematical knowledge, and his awareness of current theories of learning have all played important roles in determining his teaching style.

Nevertheless, comparing the interactions and relationships in this classroom with Wendy's, the differences seem to rest largely on the contrasting ways that the teachers listen—that is, on the different ways that they relate to their students. In Wendy's class, the mathematics is an unavoidable hindrance to relationships, a necessary evil. In Tom's class, the mathematics is much more like the "subject matter" of Gadamer's conversation, offering a space to foster relationships and to model listening. Unlike the stark separation of teacher and students seen in many classrooms, in Tom's there seems to be a true triad, a genuine potential for fusing of horizons, in part because the mathematical concepts are emerging from collective experiences, they are not being imposed on individual understandings.<sup>6</sup>

The consequences of this orientation are profound and immediately obvious in the students' engagement with the task. In particular, comparing these students to Wendy's, they too have become better listeners, more interested in and capable of attending to the insights of others and to "the speech of their own body of experience" (Levin, 1989, p. 88). The questions in this class are authentic, oriented toward developing deeper understandings, affecting the course of classroom events.

Tom's teaching, then, is not merely informed by his listening; his teaching is itself an act of listening.

### References

Dewey, J. (1927). *The public and its problems*. New York, NY: Henry Holt.

Gadamer, H-G. (1990). *Truth and method (2nd Revised Ed.)* New York, NY: Crossroad.

Levin, D. M. (1989). *The listening self*. London, GB: Routledge.

Marcuse, H. (1972). *Counter-revolution and revolt*. Boston, MA: Beacon.

Merleau-Ponty, M. (1962). *The Phenomenology of perception*. London, GB: Routledge and Kegan Paul Ltd.

Merleau-Ponty, M. (1964). *The Primacy of perception*. Northwestern University Press.

*Oxford English Dictionary*

---

<sup>6</sup> In recent years, mathematics education research has been undergoing something of a Kuhnian revolution, driven by the increasing acceptance of constructivism as an epistemological framework for understanding learning. Among the consequences of the movement are a greater awareness of the ungroundedness of mathematical knowledge and a newly legitimated interest in attending to learners as they "construct" their own sense of mathematical concepts.

But it is becoming increasingly clear that the impact of constructivism on the classroom has been limited. Perhaps this is because it concerns itself strictly with epistemological issues—with knowing—whereas teaching is more ontologically oriented—concerned with being and becoming. It is thus that I have posited listening not only as an orientation for teaching but as the basis of teaching action. As an ontologically oriented capacity, listening subsumes the insights offered by constructivism, and moves beyond those insights, locating the teacher and learner within the dynamic complexity of their respective and their combined worlds.

- Pirsig, R. (1991). *Lila: An inquiry into morals*. New York, NY: Bantam Books.
- Steiner, G. (1962). *Language and silence*. New York, NY: Atheneum.
- Taylor, C. (1989). The dialogical self. In Miley, R. et al. (Eds.) *The interpretive turn*, (pp. 304-314). Ithaca, NY: Cornell University Press.
- van Lennep, D.J. (1987). "The psychology of driving a car." In J.J. Kockelmans (Ed.) *Phenomenological psychology: The Dutch school*. (pp. 209- 216). Dordrecht: Nijhoff Publishers.
- van Manen, M. (1990). *Researching lived experience*. Toronto, ON: The Althouse Press.
- van Manen, M. (1991). *The tact of teaching*. Toronto, ON: The Althouse Press.
- Varela, F., Thompson, E., & Rosch, E. (1991). *The embodied mind*. Cambridge, MA: The MIT Press.
- Wyndham, J. (1955.) *The chrysalids*. London, GB: Penguin Books.