MIRIAM SHERIN: Okay. I'm Miriam Hamlin-Sherin, and at the broadest level the goal of my research is to understand what teachers do and why, specifically mathematics teachers. And I guess the reason I'm here is cause video is that important a context for doing my work. So like many of the other folks on this panel, I use videos of mathematics teachers to examine what teachers do and specifically to make claims about teacher cognition. So I go into a classroom, I videotape, take the video back to my office, sit there, analyze it in various ways. So here the classroom video is a direct source for my own sort of researcher's analysis of video. Now, I also take these videos and show them to teachers. So now, the classroom videos are a source for teacher's analysis of instruction. So it's the teacher who's sitting there, watching, looking, thinking about the video. And I do this in two main ways. First, individual teachers participate in what we call a video interview where teachers are asked to comment on brief excerpts of video that come from other teachers' classrooms. So I just bring in a series of video clips, show them to teachers, ask them to comment on what they notice. The other context is what I call video clubs where teachers get together regularly to watch and discuss excerpts of video, and in this case, it's the teachers' own
classrooms that are being viewed by the group. So in both cases here, we have teachers analyzing videos of instruction. Now, things don't stop there. In addition, I videotape the video clubs and the video interviews. Right? And analyze those videotapes. So the teacher's analysis of video now becomes the source of analysis for the researcher.

And I think there's two things that I'm setting up here. One, the video of teachers analyzing a classroom I think is a direct source for examining the nature of teacher cognition while commenting on video. Right? So it lets me explore how teachers think about classrooms when they're viewing those classrooms via video. In addition, I think that the teachers' analysis of the video can be thought of as sort of a second order source for analyzing teacher cognition during instruction. Okay. Why do this? Why bother studying teachers' analysis of video? Why not just do it ourselves? So let me throw out a few reasons. One, as I just suggested, the teachers' analysis of video should hopefully provide insights into how teachers think during instruction. Right? It would be hard to stop the teacher in the middle of teaching and say, wait, why did you do this? What were you thinking? So having them look at videos of classrooms is one way to get at some of that
information. Second, I think that video has the potential to highlight some key components of teaching expertise. This gets at what Kevin was talking about a few minutes ago, and I'll come back to that in a moment. And finally, I think looking at what teachers pay attention to in video may tell us something about what we as researchers should pay attention to. Right? Is it going to happen that teachers are insiders are going to be knowing to look at certain things that maybe aren't as obvious to researchers?

Okay. So back to this second point here. The main thrust of my work is focused here and on the idea that video provides us a way to examine this particular component of teaching expertise that I'm calling teacher's professional vision. And Chuck talked about this earlier. He describes professional vision as ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group. Right? So as we become part of the professional discipline, we become trained to see events in certain ways. Detectives get very good at making sense of a crime scene. If you show a meteorologist a weather map, there's some key things that are going to stand out. I claim that the same is true of teachers, that a key component of teaching expertise is this ability to look at a classroom and make sense of
what's going on. It's that viewing expertise to recognize what's significant in what's happening. And in the case of teaching, I think of teacher's professional vision as involving the ability to receive meaningful structure in classroom events. So I'm interested in the kinds of things that teachers pay attention to in the classroom and how they make sense of those events.

And I just want to emphasize two points here. One is that I think this notion of teacher's professional vision is particularly important in the context of U.S. mathematics education reform where teachers are asked to pay close attention to a lesson as it unfolds. So there's sort of a new level of sensitivity that's required so teachers can recognize, okay, here's this thing I was expecting the students to say. And now, this is the point when I was going to shift the discussion. Even veteran teachers who I think already have professional vision may need to learn to notice new kinds of events in a classroom. Second, I want to emphasize that I think video is particularly well suited for helping us to understand the nature of teacher's professional vision. So if we want to use video to study teaching, then I think thinking about teacher's professional vision makes good sense.

Okay. So let me introduce a little model that I
think has helped to structure our thinking about teacher's professional vision. When teachers view a classroom, there's a lot going on. Right? The classroom's a complex environment. They can't notice everything with equal weight. Instead, certain things are going to stand out. And I call that selective attention. So a teacher's attention might be drawn to the ideas discussed, the interactions, the level of noise. Now, once a teacher's attention is drawn to an event, the teacher's going to reason about what is seen based on his or her knowledge and understanding. Right? So a teacher might draw on his or her subject matter knowledge or knowledge of students to reason about what they know is going on. So there's these two things going on, selective attention and knowledge based reasoning. And these processes interact in a dynamic way. So on the one hand, right, what stands out to the teacher is going to influence the reasoning that takes place. But also I think a teacher's expectations of knowledge are going to drive what he or she perceives to some extent.

All right. So let me tell you what we've been doing. We have been using this lens of professional vision to investigate teachers' analysis of video. We've conducted pairs of video interviews with 48 teachers. In
the video interview, it's pretty simple. The teachers watch a series of three or four video clips and we say what do you notice. Anything else? Anything else? Now, of the 48 teachers, 32 participated in one of several video club designs, and the design varied, some monthly versus weekly, had a researcher facilitating or a teacher. And there were various kinds of clips shown and goals for the meetings. And just to be clear, so I'm interested in what the nature of teacher's professional vision is, and I'm not really going to talk about this here, but I'm also interested in the development of professional vision. So particularly in a year long video club, I look at changes in professional vision early and later for the teachers.

Okay. So while we are nowhere near having a catalog or a library of the kinds of things teachers did, we notice we have made progress in describing some of what teacher's professional vision is about. And I think we've done so in ways that help us to usefully differentiate among the comments made by different teachers. So I want to tell you a bit about what this work is. So one approach has been to simply put the teachers' comments into categories. So we focus on identifying the agent, who it is that the teacher is noticing in the video, what topic they're talking about, and we've found these four topics,
math thinking, pedagogy, climate, and management allow us to capture pretty much everything they mention. We also look at stance. Are teachers simply describing what they notice? Are they evaluating it or are they interpreting what they see? Are they making inferences? We've also worked -- oh, and I think of agent and topic can be thought of as elements of selective attention, and stance as a way of thinking of knowledge based reasoning. It certainly doesn't get at all the complexity there, but it's a start.

Okay. Now, we also work to distinguish among comments within a particular category. So, for example, we've been looking at the types of interpretative strategies that teachers do. And we notice they're interpreting it. What can we say about that? And there's been an interesting set that we've identified so far. So some teachers talk about what they notice in terms of principles. Discourse is a key to student learning and then go on to talk about what students are doing in terms of discourse. Teachers use analogies. The classroom's like a courtroom, etc., etc. Storytelling, sort of telling what they see in terms of a theme and a plot and a series of events. Lots of teachers use a self projection strategy. When I teach proportional reasoning, we talk about scale factor and use that as the frame for
interpretation. Interestingly, some teachers we have found do focus on what's missing. So they might say what I didn't see and what I was looking for was students working in groups, something like that. And a lot of times teachers are reasoning outside the video drawing on their own experiences with mathematics or information about students that wasn't visible in the clip.

Okay. I want to give you one other example where we distinguished among these comments. We looked closely at the types of comments teachers made related to student math thinking and found three main kinds. Level one we are calling where teachers simply identified statements made by students. Johnny says this. Level two the teachers were trying to get into the analyzing the meaning. I didn't understand what Danny was saying. Let's think about that. And level three teachers were really generalizing and synthesizing across a number of student ideas. What are the kids saying about flow? And in some cases, teachers' comments were remaining at one level or another though there were some teachers whose comments spanned the three levels. Particularly in the video club case where we tried to get teachers to look at student thinking, we found that teachers increased in the level of sophistication. So mainly talked at level one kind of comments early on and
proceeded to two and three later. We also examined the interaction between selective attention and knowledge based reasoning and found that changes in selective attention did influence knowledge based reasoning. So once the teachers began to look at student thinking more, it was then that they developed these more complicated ways of thinking about student thinking. But we also found that knowledge based reasoning influenced selective attention. So once they had these sort of more complex ways for reasoning about student thinking, they actually saw more complex things about students in the video. So that was of interest to us.

Okay. I thought I would just wrap up by going back to the questions that I asked earlier. I'm going to do this in a little bit of a different order. So starting with the middle one, I've tried to show that teachers' analysis of video highlights an important component of teaching expertise. Right? This nature and dynamics of professional vision. And I think we believe that professional vision is an important part of teaching expertise that it makes sense to try to use video to figure out how it works. Now, in terms of this first issue, in my comments I clearly emphasize what we're learning about how professional vision works in the context of analyzing
videos of instruction. And I just want to mention that we do have evidence concerning the relationship between changes in professional vision in the video club context and changes in professional vision in the classroom. So teachers exhibited changes in both projects in similar ways. We do need to look at this more closely, but we have some evidence that teachers' analysis of video is related to their thinking during teaching.

Okay. And finally, so what might this suggest for how we as researchers analyze classroom video? I think that's really an open question and one that we should think about. Consider, for example, I've found that most teachers when they first watch a video, they are evaluative. The teacher should have done. Why didn't they do that? And as researchers we actually try hard generally not to evaluate. Right? Saying something is good or bad just isn't that interesting for most of us what we want to do. So a teacher's approach might not be useful for us as researchers. On the other hand, I've found that teachers often relied on detailed information about students in the video, information that wasn't always visible in the video. So a teacher would say, oh, well, that Jimmy. I had him last year and he didn't know his decimals then either. Right? So it might be that knowing the history of
individual students is actually important to understanding classroom events. So I think I will stop there and open it up for questions.

(Applause)

MIRIAM SHERIN: Yes?

AUDIENCE MEMBER: In hearing about your evidence that analysis, how changes, you know, in instructional vision relates to changes in instruction?

MIRIAM SHERIN: So we observed a set of seven teachers who participated in the year long video club. We observed them either one or three times early and late in the year and analyzed the classroom videos by looking specifically at the ways the teachers paid attention to student thinking. Since that was -- I'm sorry, I didn't say that that was the focus of their video club, to look at excerpts from their classrooms of student thinking. So we found that early -- let's go back. There were three main ways their teaching changed. One, teachers simply paid more attention to student thinking later in the year. When a student's hand was raised at the end of the year, it wasn't ignored, and that was not the case early in the year. When a student had something to say, the teachers simply did more work to understand what the student said. A second change was that the teachers did more probing later in the
year of students comments and questions. So it was this sort of -- teachers even said to us they weren't sort of assuming they understood what it was that a student was saying. They were doing some probing and work to understand that. And the third change we found in instruction wasn't actually something we were looking for. We found that the teacher sort of took on a stance of learner in their classroom later in the year. So we saw teachers when a student would say something, they would say, oh, my gosh, I never thought of that. Just a second. Sometimes a teacher would even turn to the board and do a little, okay, all right, now, I'm with you and let's go on. So it was as if maybe that inquiry stance that the video had facilitated had influenced their teaching. Yes, Jay?

JAY LEMKE: I'm interested in the converse question. Did you identify changes in their professional vision in the context analyzing videos that did not carry over into classroom expression? And I'm interested in this particularly because of the issue of the ways in which what you can see in videos when you can slow it down, stop it, repeat it and so forth may not necessarily be transferable to what we can do on the fly in the classroom.

MIRIAM SHERIN: So let me give you an example and see if this answers your questions. We had teachers tell us
that sometimes in the video club they stop being a teacher and they become an observer and that that made them a little uncomfortable, that they noticed that, you know what, I'm not thinking as the teacher anymore. You got me thinking as an observer. And so I think there are some shifts that they allow themselves to engage in in the video club that they wouldn't bring over to the teaching.

JAY LEMKE: Very good.

MIRIAM SHERIN: Tim?

TIM KOSCHMANN: Two compliments and a quibble.

MIRIAM SHERIN: Okay. Maybe I'll run out of time.

TIM KOSCHMANN: Yeah. If I'm too long winded, I may never get to the quibbling. You'll be off the hook. This sort of second order study of the practices that people have around video is fabulous. And I know it's not that easy to get to that. I've been interested in pursuing this and have failed in a couple of projects to get at that kind of data. And so I'm envious and I think that's to be applauded. I also applaud your use of this notion of professional vision which clearly I found to be very important and very powerful in the research that we've done. But now, the quibble. I think that as I was listening to your presentation, I was trying to -- sort of wrestling with how I would, if I were in your shoes, if I
were doing this analysis, how would I go after this and why is it different from what you're doing.

MIRIAM SHERIN: Could you say that last part again?

TIM KOSCHMANN: How is it different from what you're doing?

MIRIAM SHERIN: I just didn't hear the part right before. How is what different?

AUDIENCE MEMBER: Well, he never did.

TIM KOSCHMANN: Sorry.

MIRIAM SHERIN: Oh, sorry. You didn't ask the question yet.

AUDIENCE MEMBER: Time's up.

(Laughter)

TIM KOSCHMANN: The thing that I found attractive about the notion of professional vision is its sort of an anti-psychological treatment of perception. And it provides --