

“I went by twos, he went by ones” Multiple Views of Graphs

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In this presentation, I use a situated and sociocultural perspective (Forman, 1996; Gee, 1996 and 1999) to examine a classroom discussion about graphs of motion stories. I address the following questions: What were the multiple perspectives and ways of talking about this mathematical representation? What resources did the participants use to socially construct an understanding of the scales on the graphs?

The data is taken from a series of classroom observations and videotaped lessons collected in a bilingual eighth-grade mathematics classroom. In this classroom students represented stories of bicycle trips using tables and graphs. I examine a mathematical discussion between two students and a teacher as they explained the scales on the graphs they had constructed for a problem about a bicycle trip.

The analysis shows that there were multiple views of the meaning of the marks on the vertical axes of the graphs and multiple ways to describe these scales. I use transcript excerpts to illustrate multiple meanings for the phrase “I went by” and to describe multiple ways of talking about the scales on the graphs. This discussion did not explicitly focus on different interpretations. Instead, each student described what he had done to construct his graph and how he saw the results of his actions. These two students developed an understanding of the scale on the vertical axis by engaging in a discussion detailing their different perspectives of the scales on the two graphs. The clarification and negotiation of these multiple views and descriptions was one way that understanding of this representation was socially constructed. The analysis also shows how the graphs, the teacher, the verbal descriptions, gestures, and the multiple perspectives themselves provided resources for socially constructing the meaning of this representation. When students are making sense of a problem and have some intellectual authority, then verbal descriptions can signal the times and places where views of a representation are or are not shared. In this discussion multiple verbal descriptions marked a place where inter-subjectivity broke down. But this break down was not an obstacle. In fact, the multiple views themselves were a powerful resource for constructing mathematical understanding.

References

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