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Strengthening student understanding of mathematical language through verbal and written representations of the intermediate value theorem.

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Summary: As part of a larger research study, this paper describes calculus students' reasoning about the intermediate value theorem (IVT) in verbal, written, and graphical form. During interviews, students were asked to verbally describe the IVT in their own words. They then provided written descriptions, watched video of their verbal descriptions, and then compared the two. Finally, the students were asked to draw a graph that illustrated the IVT and were asked to discuss how the graph related to their written response. Our goal for this portion of the study was to make students more aware of their own language, to better attend to the precision necessary in mathematical language, and to strengthen their understanding of the IVT through this process. Data indicate that self-editing and attempting to identify discrepancies between mathematical statements can help students to more carefully analyze their own mathematical language and notation. We also saw that student use of notation and understanding of notation are not necessarily related at this level of mathematics.

Classification: E45 I25 D45
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