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Shawn Firouzian* (sfirouzi@ucsd.edu), 1 Miramar St, 929265, La Jolla, CA 92092. *Any correlations among students' ways of thinking about the derivative and their abilities to solve the applied derivative problems.*

Students' understanding, thinking and difficulties with the derivative and their difficulties in solving applied problems have been the subject of rich research work. Very little research has examined students' ways of thinking about derivative through the lens of their work on applied questions. This presentation represents the results of two phases study looking at the correlation between students' thinking about the derivative and their abilities solving related rate, optimization and graphing problems. Survey data and clinical interviews were conducted to look at students' multiple ways of thinking and their work on applied derivative problems. "Multiple ways of thinking" refers to two or more ways of thinking about derivative (e.g., slope of the tangent line at a point on a function or instantaneous rate of change). Fine-grained analysis of the students' written surveys and clinical interviews revealed that students' having more than two ways of thinking about the derivative correlate to their higher abilities in solving applied derivative problems. (Received September 20, 2016)