

1116-VR-2402 **Cameron O’Neill Byerley*** (cameron.byerley@asu.edu). *The impact of Calculus students’ understanding of quotient on their understanding of rate of change functions.*

Students’ understandings of fractions in 5th grade is predictive of their overall mathematics achievement in high school (Siegler et. al. 2012). However, there is little research on university Calculus students’ meanings for fraction and quotient and the impacts of these meanings on understanding derivatives. Understanding derivative as a function whose values are rate of changes requires students to understand fractions, quotients and constant rate of change. I investigated these issues with student interviews and a diagnostic measure of 112 Calculus students at a large southwestern public university. Many students could not place fractions on a number line or find a change in y given a constant rate of change and a change in x . Variation in students’ responses to items about fraction, quotient and rate was predictive of variation in success on test questions about rate of change functions ($n = 112$, $p = .0001$). In particular, the ability to estimate a slope of a line on a blank graph with equally scaled x and y axes was predictive of success on tests in Calculus. I will present items, distributions of student responses and the relationship between students’ success in the course and their performance on the diagnostic items. (Received September 22, 2015)