1077-M1-2546   **Jason Martin*** (`jasonm@uca.edu`), Department of Mathematics, MCS 234, 201 Donaghey Ave., Conway, AR 72035, and **Michael Oehrtman**, **Craig Swinyard** and **Beth Cory**. *Quantitative Reasoning During Definition Formation: The Case of Absolute Value.*

The purpose of this research was to gain insights into how calculus students might develop an understanding of formal limit definitions. By employing the method of guided reinvention, we have conducted teaching experiments with pairs of students to observe the emergence of formal sequence convergence definitions. This presentation focuses on two different teaching experiments where two pairs of students, neither pair containing students who had received any instruction on formal limit definitions, constructed rigorous definitions for sequence convergence. A key component of any formal definition of sequence convergence is the use of absolute value to denote the distance between individual sequence terms and the value of the limit. Indeed, one pair of students conceived of absolute value as this measurable attribute of sequence graphs (i.e. a quantity). The other pair of students, however, conceived of the absolute value as a transformation, mapping negative values to positive values. Results revealed the importance of conceiving of absolute value as a quantity as this conception supported the first pair of students in progressing forward in creating their formal definition, while the other pair struggled to formulate their ideas in the context of a transformed sequence. (Received September 22, 2011)