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Kyeong Hah Roh* (khroh@math.asu.edu), School of, Mathematical and Statistical Sciences, Tempe, AZ 85287. *A design of instructional interventions for the resolution of cognitive dissonance in an advanced calculus class.*

This study examines how instructional interventions help students experience and resolve cognitive dissonance, especially in undergraduate mathematics courses. In particular, this study focuses on the nature and its role of the ε -strip activity in studying the $\varepsilon - N$ definition. The study was conducted as part of a larger study from a semester long teaching experiment at a public university. The subjects of the study was mathematics students in an advanced calculus course. Students in the course worked in small groups with proper guidance from their instructor. Dewey's theory of reflective thinking was used in the analysis of the data. The students in the study initially experienced cognitive dissonance due to the discrepancy between their preconceived notion of limit and the $\varepsilon - N$ definition. However, their cognitive dissonance was resolved as they engaged in the ε -strip activity. Furthermore, a proper image of limit was formed through the ε -strip activity, and the students continued reflecting on the ε -strip activity while determining convergence of sequences, and proving properties of convergent sequences in \mathbb{R} . (Received September 23, 2009)