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**Joyce A Cutler\*** ([jcutler@frc.mass.edu](mailto:jcutler@frc.mass.edu)), 100 State Street, Framingham, MA 01701. *An Analysis of Students' Development of Understanding of Number Systems.*

The paper includes an examination the development of number systems from two perspectives, mathematical and psychological. In the early twentieth century, mathematicians attempted to find a rigorous definition for number and arithmetic based upon an axiomatic system related to set theory. They constructed mathematical objects and operations that resulted in the real number system. Students construct individual conceptions of these mathematical objects. The theories of Piaget, Dubinsky, and Sfard provide a basis for the investigation of the development of students' understanding of number from a psychological perspective. The researcher proposes that similarities can be found in mathematicians' axiomatic approach to number and in the development of students' understanding of number. The paper includes evidence drawn from a study of middle school students' understanding of non-negative rational numbers and from a study of Real Analysis students' understanding of real numbers. (Received September 19, 2007)