1154-N5-1484 **Yufeng Ying*** (yy16186@uga.edu), 1000 Lakeside Drive Apt351B, Athens, GA 30605, and **Kevin C Moore**. *A conceptual analysis of students' abstracted structural reasoning.*

"Structural reasoning" is a term that has been widely used in mathematics education but loosely defined. Built from previous research on Piaget's reflective abstraction, Arcavi's symbol sense, Hoch's structure sense, and Harel's structural reasoning, we introduce the notion of "abstracted structural reasoning" to model students' mental operations in abstracted arithmetic structures including analyzing arithmetic structures, using arithmetic structural properties in problem solving, and associating between different arithmetic structures. For example, equation ab/(a+b)=4 quantifies the ratio between "ab" and "a+b," and also enables inferring information on the sum "1/a+1/b=1/4". To use the rich inferences that one can gain from an arithmetic structural, students are required to abstractedly reflect on their various meanings for such a structure. Building on data from clinical interviews with several pre-service teachers, we illustrate examples of students' abstracted structural reasoning along with conceptual analysis, highlighting both affordances and constraints of such reasoning. Against this backdrop, we illustrate that students' abstracted structural reasoning supports solving general algebraic questions and having a dynamic understanding of an algebraic expression. (Received September 15, 2019)