1077-M1-2805 **Aviva Halani*** (aviva.halani@gmail.com), aviva.halani@asu.edu. *Students' Ways of Thinking about Enumerative Combinatorics Problems: Deletion and Equivalence Classes.*

This presentation aims to address students' ways of thinking about enumerative combinatorics problems. Fourteen undergraduates with no formal experience with combinatorics participated in individual task-based interviews in spring 2011. Open coding was used to identify students' ways of thinking about the set of elements being counted, called the solution set, as they engaged in combinatorics problems. This presentation focuses on two ways of thinking which emerged from the data analysis: Deletion and Equivalence Classes. Both involve creating a new, related combinatorics problem and then finding a relationship between the solution set of the new problem and that of the original problem. The students found an additive relationship in Deletion and a multiplicative one in Equivalence Classes. In the study, students naturally engaged in Deletion but for certain tasks they were able to construct the solution set of a new problem, yet were unsuccessful in finding the size of the original solution set. Through instructional interventions, they developed Equivalence Classes and were successful in solving the tasks. We will discuss student struggles with engaging in Equivalence Classes and suggest ways to guide students to develop and extend their preliminary ways of thinking. (Received September 22, 2011)