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Catherine Case* (ccase@ufl.edu), **Melanie Battles** (m.battles@ufl.edu) and **Tim Jacobbe** (jacobbe@coe.ufl.edu). *Toward a Conceptual Understanding of P-values: The Advantages and Challenges of Randomization-Based Inference.*

Before modern computing power allowed for rapid simulations, introductory statistics courses necessarily relied on methods like z tests and t tests to introduce the core logic of inference; today, a growing number of statistics educators (e.g., Cobb, 2007) are proposing that these traditional methods be replaced or supplemented with randomization-based tests which more directly model the randomness inherent in the study design. To explore whether conceptual understanding of p-values could be improved by exposure to randomization-based inference, we conducted lessons in which students familiar with traditional inference methods used physical and computer simulations to estimate p-values. To assess the impact of the lessons, we prompted students to write brief explanations of p-values without relying on statistical jargon, to apply these explanations in different contexts, and to self-evaluate their understanding before and after participation. Citing previous research and examples of student responses, we will present our findings on students' varying conceptions of p-values. We will also suggest possible modifications to the simulation activities to address enduring misconceptions and the particular challenges of randomization-based inference. (Received September 10, 2013)