Students' Perspectives about Statistics: Developing an Instrument to Capture Beliefs about our Field

Recent research has begun to address students' attitudes and beliefs about statistics, but much work remains to be done to validly measure students' statistical perspectives. As a relatively young and dynamically evolving discipline, statistics may stir several different images for new students. For example, statistics has historically been viewed as a sub-discipline of mathematics where computational fluency was a prerequisite for success. But doing statistics well also requires careful investigation, curiosity, and contextual sensitivity to derive meaningful insights from data. Understanding how new students perceive of the discipline of statistics may reveal insight on both their curricular expectations and their readiness for careers in statistics and data science. Our research prompted the development of an instrument to assess students' perspectives about the purpose of statistics, the process of doing statistics, and the characteristics of a statistical expert. Using focus group data and interviews with students, we identified four disciplinary perspectives that students expressed about statistics—Rules-based, Descriptive, Confirmation, and Investigative. Using this data, as well as existing instruments for mathematics and science beliefs, we crafted 36 items, with 9 items representing each disciplinary perspective. Through several stages of qualitative and quantitative data collection involving over 1,000 introductory level students, we revised and validated our instrument. In this talk, we will describe our instrument, discuss the validation of our instrument, and share our ideas for using the instrument. We believe this instrument may be useful in many research contexts, including the use of understanding how students' beliefs about statistics may change after taking a statistics course.