Research Statement

Jason M. Bryer, Ph.D.

Given my background in mathematics and computer science, my research agenda has naturally fallen around statistics and methodology. I have substantial experience using R including authoring over a dozen R packages. The use of R also allows me to engage in open and reproducible research (most of research projects can be viewed on my Github page at http://github.com/jbryer) for which I am a strong advocate of with colleagues and students. Recently, I have been exploring the role of data science in education. Specially, apply data science principles for the analysis of educational data (e.g. PISA, TIMSS, NAEP, etc.). My non-statistical research interests include school choice (including both charter and private schools) and academic self-regulation. Additionally, I have collaborated with a number of colleagues providing statistical and/or methodological expertise. Below are brief statements about the four main areas of research I have and will continue to be engaged in.

Propensity Score Analysis

Related to propensity score analysis (PSA), I have developed three R packages implementing new methods for analyzing multilevel data, matching for non-binary treatments (i.e. two treatments and one control), and bootstrapping PSA. I will continue to refine these R packages and have also begun writing journal articles on these new PSA methods. Also related to PSA, I am in early discussions to write an Applied PSA with R book for CRC Press. Additionally, the next area of PSA I wish to investigate is the use of PSA with longitudinal data.

Data Visualization

The use of data visualization is present in all areas of my research. For instance, the preferred method of presenting results in all of my PSA R packages is graphical in form. In addition to PSA, I have developed an R package for analyzing and visualizing Likert type data. I also make frequent use of visualizations in my teaching and will continue to develop new visual ways of teaching.

Academic Self-Regulation and Formative Assessment

I am currently the principal investigator in a grant proposal (development is currently internally funded at Excelsior College) to develop a Diagnostic Assessment of College Skills (DACS). DACS is a low-stakes, formative assessment, assessing students college readiness in reading, writing, math, self-regulation, math anxiety, and test anxiety. The tool will provide students and academic advisors with important feedback regarding their college skills. The inclusion of self-regulation allows us to provide more meaningful and actionable feedback to students.

School Choice

My dissertation explored the effects of charter schools over traditional public schools using the National Assessment of Educational Progress (NAEP). My results from this study suggested there is little or no difference in the academic performance between charter and traditional public school students in NAEP. Future research will explore the differences between states as well as longitudinal trends.