

# Teaching Statement

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**Summary** My teaching philosophy is simple: to cultivate students' critical thinking and quantitative reasoning skills, and to provide applied, practical training to help students answer questions of substantive importance. The era of 'big data' brings into sharper focus the need for citizens to be quantitatively literate—to be able to parse empirical arguments and reach reasonable conclusions. At every turn we face new claims, purportedly supported by data, meant to guide our behavior or govern our choices. My fundamental goal as an instructor, whether in a statistics course or a substantive seminar, is to inspire students to question claims in reasoned, quantitative ways. By providing applied skills, rooted in a strong conceptual and theoretical framework, I aim to give students the tools to engage in research of their own, and thus make a high-quality contribution to the scientific enterprise.

## Experience

I have served as a teaching assistant for various graduate-level methods courses, and as an the instructor of record for an undergraduate research methods course. At Carolina, I have served as a TA for Introductory Statistics and Intermediate Statistics, and as the instructor for the undergraduate-level Introduction to Political Research. As part of the Inter-university Consortium for Political and Social Research, I have also served as a teaching assistant for Advanced Bayesian Methods and for Multilevel and Hierarchical Modeling.

**Graduate Courses at UNC** I have served twice as a TA for Introductory Statistics (Fall 2013, 2014), both times under the direction of Justin Gross (jhgross@umass.edu). The course is the first-semester introduction to quantitative methods for incoming graduate students in political science. In 2013, I worked closely with Justin to reform the curriculum. As part of the reforms, I developed a semester-long plan for the one-credit lab course that accompanies the class. The lab focused primarily on computation, introducing students to R, as well as introducing advanced topics in simulation, visualization, Bayesian statistics and optimization. Teaching incoming students R from the outset has better prepared them for later coursework, and has enabled many students to engage in advanced research more quickly.

I have also worked twice as the TA for our second-semester methods course on linear models, each time under the direction of Tom Carsey (carsey@unc.edu). This course also includes a one-credit weekly lab session, which I taught. In past years, this course served as the primary introduction to R, but having reformed the lab section for the first-semester course provided me with flexibility in designing the lab curriculum. I focused on two goals. I introduced students to typesetting in L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, and to I covered advanced topics related to linear models. I focused primarily on Bayesian methods for estimating linear relationships, including Bayesian Gaussian models, mixture models and linear regression.

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**Graduate Courses at ICPSR** In 2015, I served as a TA for two courses: Advanced Bayesian Methods (ABM), under the direction of Jeff Harden (Jeff.Harden@colorado.edu) and Daniel Stegmüller (d.stegmueller@gmail.com); and Multilevel / Hierarchical Models (MHM), under the direction of Tom Carsey. The four-week ABM course covered advanced topics in Bayesian analysis, including how to program various Markov Chain Monte Carlo algorithms, how to construct and derive samplers for complex models, and how to specify many common ‘workhorse’ regression models. As TA, I wrote four of the course’s eight homework assignments, and graded all assignments; held daily office hours; and taught a three-hour lecture on building and fitting Bayesian finite mixture models. The one-week MHM course covered model specification and fitting for hierarchical data. As TA, I led a one-day intensive session on Bayesian specification of hierarchical models. This session started from the fundamentals of Bayesian inference, and included hierarchical model specification in the statistical platform Stan.

**Undergraduate Methods** I am currently teaching the undergraduate research methods course in political science. The class teaches 30 undergraduate students how to statistically evaluate data. We begin from first principles, discussing probability and its role in making inferences, before advancing to topics in univariate and bivariate statistics, linear regression and methods for categorical outcomes. With each topic, I emphasize two vital skills: cultivating students’ conceptual understanding of how the statistics relate to learning about real-world processes, and teaching students how to conduct their own research, including how to use R. Most students in the course do not plan to enter academia, but nearly all wish to enter fields where quantitative analysis skills are highly prized. By carefully building assignments targeted at *applying* concepts to real data, I find students quickly overcome apprehension about statistics and programming, and become excited about the prospect of acquiring important, marketable skills in data analysis.

**Other Experience** In 2015, I established the Carolina Text as Data lab, which brings together students and faculty interested in harnessing text to answer substantive questions. As part of this initiative, I have led sessions on how to collect, clean and process textual data in Python and R. Getting text into formats suitable for quantitative analysis is often a prohibitive impediment to scholars who want to harness text in their research. Through these sessions, I provide straightforward examples of how to process text, and in so doing reduce the ‘startup’ cost for faculty and students who want to begin using text as data. I have also worked for two years at the Odum Institute for Research in Social Science at UNC as a statistics consultant. As a consultant, I hold open office hours for students and faculty with questions related to statistics or statistical computing, broadly defined. This has exposed me to researchers from many disciplines and at many levels of technical expertise, and helped me to cultivate my ability to teach statistical and programming skills to a diverse audience.

## Courses

I am particularly interested in teaching graduate and undergraduate courses in quantitative methods, as well as substantive classes in American politics. In addition to introductory American courses, I could teach political communication, public opinion and campaigns and elections.

Within research methods, I could teach core classes in your methods sequence, and I could also offer courses on Bayesian statistics, text as data and computational methods. I describe four courses I would like to teach below.

**Bayesian Statistics** An introduction for advanced graduate students to Bayesian modeling and estimation, including when and why Bayesian methods provide a compelling alternative to more traditional methods; the logic of Bayesian inference; how to construct models and specify prior distributions; and how to derive sampling schemes to fit models. The course would cover applied Bayesian methods for cross-sectional, hierarchical and time series data.

**Text as Data** A course on approaches for collecting, processing, cleaning and analyzing large text corpora. Having taught on various topics in text analysis, I find that many students wish to harness textual data, but perceive the methods as too advanced or complicated. This course would draw on advanced methods from statistics, machine learning and natural language processing, but would also focus on practical implementation for applied research.

**Computational Methods** A course on statistical computing covering theoretical and applied topics. The course would cover advanced statistical programming and package development in R, and how to improve performance by efficient coding, parallelization or by writing functions directly in C++. The course would explore topics central to computational social science, including managing large-scale data, optimization and sampling techniques (e.g., Expectation Maximization, MCMC, gradient-based methods), and emerging topics in deep learning artificial intelligence. Examples for the course would be drawn from areas such as large-scale classification and prediction, text analysis and network analysis.

**Political Communication** A seminar course, at the graduate or undergraduate levels, focused on issues related to how elites communicate their ideas, how these ideas are conveyed through media, and how citizens receive and interpret political messages. Topics would include campaign rhetoric, priming and framing effects, media new and old, and how political messages emerge, propagate and fade. I would also dedicate some readings to new, interdisciplinary methods for analyzing news stories, blog posts, speeches and manifestos.

For more information about my teaching experience, you can visit my website at <http://www.unc.edu/~bdlacree>, or you can contact me at [brice.acree@unc.edu](mailto:brice.acree@unc.edu) to request examples of course materials, including lecture slides, notes and homework assignments. Justin Gross, Tom Carsey, Jeff Harden and Daniel Stegmueller can provide reviews of my teaching, though as a TA I did not receive official evaluations. I can provide evaluations from my current undergraduate methods course at the end of the Fall 2015 semester.