Political Science 2581

QUANTITATIVE RESEARCH WORKSHOP

Paul Testa
Assistant Professor
paul_testa@brown.edu

Fall 2021 - Spring 2022

General Information

Canvas https://canvas.brown.edu/

Where/When We meet Mondays, 1:30–4:00 pm, in 111 Thayer Room 140.

Office Hours Mondays, 1–3 pm in 111 Thayer 339 or other times on Monday by appointment. If you know in advance that you want to come to office hours, please email me to reserve a 20 minute slot.

Overview

This course covers selected topics in research design and applied statistics offering students a workshop where they will develop and present quantitative empirical projects. The course will provide an overview of current best practices for the design, implementation, analysis, and presentation of empirical work with a particular emphasis on ways to enhance the transparency, reproducibility, and credibility of such work.

We meet every two weeks over the spring and fall semesters. During the fall semester, we will examine strategies for causal inference in experimental and observational designs. During the spring semester we will cover specific topics tailored to the research projects of the students in the course. The topics outlined below are provided as possible examples, but are subject to change based on student input during the fall. The course is structured around 1) lectures that provide a broad overview of the concepts and theories of a given method, 2) applications that explore the practice (and pitfalls) of given method in recent published work and 3) presentations in which students present and comment on their on-going projects.

Learning Goals & Objectives

This course aims to help you develop expertise in areas of applied statistics that are directly relevant to your own research. We will build upon the skills you have developed in POLS 2580 and 2590 in descriptive, predictive, and causal inference, with a focus on helping you apply these methods to new or own-going research. In particular, this course is focused on helping you take a project from proposal to published paper. As such, in addition to expanding and refining your methodological toolkit, we will place a special emphasis on developing skills to help you plan, implement and present your work, from drafting a pre-analysis plan to navigating the process of peer review.

Requirements

First, to successfully complete this course, you will need a quantitative empirical research project that you are passionate about and excited to work on.[1] Your project may be an idea from a seminar paper, a chapter from your dissertation, or some other on-going work in progress that you think will benefit from being worked on in this course. You may use observational or experimental designs that draw on existing data or require you to collect new data.[2] We will talk through what's feasible and appropriate in class. You may work in collaboration with another peer in the course on a co-authored project, but not on a project co-authored with faculty. Feel free to reach out at any time before, during or after the course with concerns.

Second, to successfully complete this course, you will need to submit a proposal to present your paper at an academic conference held within one year of the end of this course. The New England and Midwest Political Science Associations Annual Meetings are typically held in April with deadlines for submitting proposals typically in October/November. Submissions for the American Political Science Association's Annual Meeting, now held in late September, are typically due in January, while submissions for the International Studies Association Annual Convention held in late March/early April are due in June. Proposals for the Southern and Western Political Science Association's Annual Meeting held in January are typically due in September.[3] Your paper need not be accepted to complete this course, but your expectation in taking this course is that you will produce a paper that you will present at academic conference (and ultimately publish in a peer reviewed journal).

In addition to having a research project you care about, I will assume the following:

[1] This is in no way a commentary on the relative merits of quantitative versus qualitative research or empirical versus more theoretical endeavors. Instead, this "requirement" reflects a desire to 1) students more opportunities for training in advanced quantitative methods 2) in a format that encourages and supports their efforts to present and publish their work.

[2] Within reason. You're not going to design and implement a field experiment in two semesters. You could perhaps pilot an aspect of your intervention on convenience sample.

[3] You can and should submit your paper to other conferences as well. APSA, ISA, and the regional conferences are large gatherings that accept a lot of proposals which makes them a good place to start if you've never presented at a conference before. This can both good (high probability of acceptance) and bad (high probability of bad panels/discussants). We'll talk strategies and specifics in class.

1. You have completed POLS 2580 and POLS 2590 (or the equivalent)
2. You are conversant in the probability, math, and statistics necessary to have completed POLS 2580 and POLS 2590.
3. You are comfortable programming in R, writing in LaTeX, and presenting with Beamer.

In short, if you've met the first requirement, the second and third requirements should follow. If you haven't taken POLS 2580 and 2590 please contact me so we can talk about if this course is the right course for you at this point in your graduate career. It's okay if your differential calculus is a little rusty or you mostly write in Word. If for some reason you're deeply committed to working in Stata or SPSS, and only Stata or SPSS, we should probably talk, as all of the empirical examples and applications in this course will be coded in R

More broadly, if you have any concerns about if this course is for you or if your project is appropriate please don't hesitate to reach out.

Course Structure

Broadly, the course is organized around a sequence of lectures, applications, and presentations.

For a given topic, such as causal inference in experimental designs, our first meeting will be devoted to reviewing the concepts, theories, and principles of this method. Readings for this session will typically draw on textbooks and seminal articles. Whereas POLS 2580 and 2590 provided in-depth discussions of core concepts, POLS 2975 will provided broader surveys of a method and its applications. While the first two methodological topics of the course are fixed – causal inference in experimental and observational designs – the latter topics of the course are open to change based on the projects and research interests of the class.

Our second session on a given method will focus on applications of this method published that have been recently published in top journals. We will typically read at least one and sometimes two articles using a given method. Each student will be asked to present at least one of these applications as if it were their own paper. Students will code to replicate the core results of the paper(s) and we will explore the technical and practical challenges of applying and implementing a given method together in class.

Throughout the course, students will present updates and summaries of their own research and comment on their peers' work. The format of these presentations will vary from short memos, brief slideshows, to more formal presentations. They are designed to ensure you are making progress on your project, provide you opportunities for feedback on that project, and finally, to give you ample opportunities to practice presenting and communicating your work.

Readings

There are no required textbooks for the course. All readings will be made available to you via Canvas.

However, we will read selections work from the following texts, which you may wish to purchase for your own reference:

- Imbens, G. W. and Rubin, D. B. (2015). *Causal inference in statistics, social, and biomedical sciences*. Cambridge University Press
- Rosenbaum, P. (2018). *Observation and experiment*. Harvard University Press
- McElreath, R. (2018). *Statistical rethinking: A Bayesian course with examples in R and Stan*. Chapman and Hall/CRC
- Grimmer, J., Stewart, B. M., and Roberts, M. E. (2021). *Text as data: A new framework for machine learning and the social sciences*. Princeton University Press

Assignments & Grading

Your grade for this course is a weighted reflection of your performance on the following general assignments:

Project and Conference Proposal	10%
Project Planning and Draft	20%
Conference Paper	30%
Discussant Comments	10%
Conference Presentation	20%

Each assignment is intended to reflect one step in the process of taking a paper from proposal to publication. Each assignment contains multiple parts that are due on Canvas before the associated class detailed in the schedule below. (e.g. You will submit your project proposal, then feedback on your peers proposal, than a finalized proposal with a targeted academic conference) **Failure to submit a paper abstract as a conference proposal will result in a non-complete for the course.**

Course Time Allotment

Over two semesters, we will meet 15 times. You should expect to spend 2.5 hours per week in class (37.5 hours total); 5 hours per week reading the required materials (75 hours total); and roughly 5 hours each week working on your project (an hour a day each weekday) (75 hours total)

Extensions & Late Penalties

All assignments should be turned in on Canvas before the start of class the week they are due. Because many assignments will involve peer feedback and discussion, late assignments will receive an automatic one letter grade penalty.

Laptops

You will need your laptops for the data analysis portions of the class, but I strongly prefer that you do not use them during lecture and discussion.

Accessibility

Brown University is committed to full inclusion of all students. Please inform me early in the term if you may require accommodations or modification of any of course procedures. You may speak with me after class, during office hours, or by appointment. If you need accommodations around online learning or in classroom accommodations, please be sure to reach out to Student Accessibility Services (SAS) for their assistance (seas@brown.edu, 401-863-9588). Undergraduates in need of short-term academic advice or support can contact an academic dean in the College by emailing college@brown.edu. Graduate students may contact one of the deans in the Graduate School by emailing graduate_school@brown.edu.

Tentative Schedule

Topics and readings subject to change. Additional readings posted to canvas

Fall 2021

1 — September 13, 2021— Course Overview

Summary: What is this course all about?

Readings: None, but come prepared to talk about your research interests and project ideas

2 — September 27, 2021— Some Best Practices for Empirical Research

Summary: A review of principles and strategies for doing empirical social science research • Why reproducibility matters? • The power of pre-analysis plans • The importance of "tidy" data. • The importance of good data visualization.

Readings:

Munafò, M. R., Nosek, B. A., Bishop, D. V., Button, K. S., Chambers, C. D., Percie Du Sert, N., Simonsohn, U., Wagenmakers, E. J., Ware, J. J., and Ioannidis, J. P. (2017). A manifesto for reproducible science

Blair, G., Cooper, J., Coppock, A., and Humphreys, M. (2019). Declaring and diagnosing research designs. *American Political Science Review*, 113(3):838–859

Wickham, H. (2014). Tidy Data. *Journal of Statistical Software*, 59(10)

Healy, K. and Moody, J. (2014). Data visualization in sociology. *Annual review of sociology*, 40:105–128

Assignment: Proposals: Initial Proposal Submit your project proposals on canvas. I will circulate for peer review and we will discuss next class

3 — October 11, 2021— Causal Inference for Experimental Designs

Summary: Why experiments? • Different Types of Experiments • Yes, but what's the mechanism?

Readings:

Imbens, G. W. and Rubin, D. B. (2015). *Causal inference in statistics, social, and biomedical sciences*. Cambridge University Press, selections

Imai, K., Keele, L., Tingley, D., and Yamamoto, T. (2011). Unpacking the black box of causality: Learning about causal mechanisms from experimental and observational studies. *American Political Science Review*, 105(4):765–789

Assignment: Proposals: Proposal Feedback You each will provide written feedback on the proposals submitted last session. We will discuss in class.

4 — October 25, 2021— Applications: Conjoint Survey Experiments & Causal Mediation Analysis

Summary: Using conjoint experiments to estimate ACMEs • Conducting Causal Mediation Analysis

Readings:

Hainmueller, J. and Hopkins, D. J. (2015). The hidden American immigration consensus: A conjoint analysis of attitudes toward immigrants. *American Journal of Political Science*, 59(3):529–548

Chaudoin, S., Gaines, B. J., and Livny, A. (2021). Survey Design, Order Effects, and Causal Mediation Analysis. *The Journal of Politics*, 83(4):000–000

Assignment: Proposals: Finalizing your Proposals Submit your finalized proposal – what conference do you plan to apply to

5 — November 8, 2021— Causal Inference for Observational Designs

Summary: General principles and strategies for making causal claims with observational data • Principles of design-based inference • Sensitivity Analysis

Readings:

Rosenbaum, P. (2018). *Observation and experiment*. Harvard University Press, selections

Sovey, A. J. and Green, D. P. (2011). Instrumental variables estimation in political science: A readers' guide. *American Journal of Political Science*, 55(1):188–200

Skovron, C. and Titiunik, R. (2015). A Practical Guide to Regression Discontinuity Designs in Political Science. Technical report, working paper, University of Michigan

Assignment: Planning: Project Outline Submit an outline/draft of your project: Introduction, theory, data & design, expectations. Lay out a timeline of what you have accomplished and what you need to do (e.g. IRB approval, data collection) If conducting and experiment, frame this as a pre-analysis plan. Again, we will circulate these documents for peer review and commentary

6 — November 22, 2021— Applications: Regression Discontinuities and Instrumental Variables

Summary: Exploring two of the most frequently used research designs for making causal claims with observational data

Readings:

Lehmann, M. C. and Masterson, D. T. (2020). Does Aid Reduce Anti-refugee Violence? Evidence from Syrian Refugees in Lebanon. *American Political Science Review*, 114(4):1335–1342

Hangartner, D., Dinas, E., Marbach, M., Matakos, K., and Xefteris, D. (2019). Does exposure to the refugee crisis make natives more hostile? *American Political Science Review*, 113(2):442–455

Assignment: Planning: Project Feedback We will discuss the outlines you shared last session. You will present your work in pairs, taking turns presenting and offering feedback and comments.

7 — December 6, 2021— Project Workshop

Summary: We will use this class as workshop to discuss the status of your projects. Come prepared to provide a brief 5-8-minute presentation that gives an overview of your project, a summary of your accomplishments this semester, and timeline for next steps

Readings: None

Assignment: Planning: Project Status Presentation

Winter Break

Assignment: Work on your projects Over winter break you will continue to work on your projects. Use this time to draft sections of your paper, collect data, and conduct preliminary analyses if possible. At a minimum, you should have working drafts of your paper's introduction, theory, and research design by the start of class.

Spring 2022

8 — January 26, 2022— Project updates

Summary: We will use this class to check in on our projects. Come prepared to provide a brief 5-8-minute presentation that gives an update on the status of your project, what you hoped to accomplish over winter break and what you actually accomplished over winter break, and a proposed timeline for the coming semester

Readings: None

Assignment: Planning: Project Status Updates. See summary above.

9 — February 9, 2022— Bayesian Statistics and Regression Models

Summary: Intro/review of Bayesian (vs Frequentist) Statistics • Priors, Likelihoods, and Bayesian Inference • Bayesian Regression Modelling

Readings:

McElreath, R. (2018). *Statistical rethinking: A Bayesian course with examples in R and Stan*. Chapman and Hall/CRC, selections

Assignment: Papers: Preliminary Data Analysis Submit a memo providing some preliminary results and analysis

10 — February 23, 2022— Applications: Multilevel Regression with Post-Stratification

Summary: What is MrP? • When is MrP useful • How do we do MrP • What should we worry about?

Readings:

Hanretty, C. (2020). An Introduction to Multilevel Regression and Post-Stratification for Estimating Constituency Opinion. *Political Studies Review*, 18(4):630–645

Bisbee, J. (2019). Barp: Improving mister p using bayesian additive regression trees. *American Political Science Review*, 113(4):1060–1065

Assignment: Papers: Discussion Preliminary Data Analysis Discussion and peer commentary of preliminary results and analysis

11 — March 9, 2022— Text as Data

Summary: Text as data • Acquiring and working with text as data • General principles of machine learning • Classification

Readings:

Grimmer, J., Stewart, B. M., and Roberts, M. E. (2021). *Text as data: A new framework for machine learning and the social sciences*. Princeton University Press, selections

Assignment: Papers: Preliminary Draft Submit an initial draft of your paper incorporating preliminary analysis

12 — March 23, 2022— Applications: Clustering Methods, Topic Models, and Methods for Classification

Summary: Clustering Methods • Topic Models • Methods for Classification

Readings:

Grimmer, J., Stewart, B. M., and Roberts, M. E. (2021). *Text as data: A new framework for machine learning and the social sciences*. Princeton University Press, selections

Benoit, K., Munger, K., and Spirling, A. (2019). Measuring and explaining political sophistication through textual complexity. *American Journal of Political Science*, 63(2):491–508, selections

Assignment: Papers: Preliminary Feedback Peer discussion and feedback on preliminary drafts

13 — April 6, 2022— Presentation and Paper Workshop

Summary: We will use this class as chance to workshop your presentation and papers as some of you may be presenting at MPSA

Readings: None

Assignment: Presentations and Papers Upload a draft of your presentations and revised papers to Canvas for peer review

14 — April 20, 2022— Class Presentations

Summary: We will treat this class as practice conference presentation. Each of you will make 10 minute presentations of your own work, provide 5 minutes of

discussant comments, and engage in 5-10 minutes of questions from the audience

Readings: None

Assignment: Presentations and Discussant Comments Submit your final presentations and discussant comments to Canvas

15 — May 4, 2022— From Presentations to Publications

Summary: In our last class we will discuss strategies for turning your conference papers into publications

Readings: None

Assignment: Final papers Submit your revised papers, including a publication strategy to Canvas