PS 200E: Experimental Design for Social Science
Fall 2020

Graeme Blair (Web) graeme.blair@ucla.edu
OH: MW 11:30-12:30pm PST (Zoom)

Class sessions: MW 9-10:50am PST (Zoom link shared via email)

Course overview

This course covers the design, implementation, and analysis of experiments in the social sciences. The focus is on field experiments, but the core ideas will also apply to lab, survey, online, and lab-in-the-field experiments.

Learning objectives

- How to identify and address key threats to experimental designs
- How to implement key components of experimental design and analysis in code
- How to assess design choices in your own experiments through simulation
- Gain experience replicating the design and analysis of prominent experiments
- How to conduct a (small-scale) field experiment

How we will meet these goals

We will read methodological works and published experiments, and to promote active engagement with the readings we will use the Perusall reading discussion platform. There is growing evidence that live lectures are not effective learning tools for many students. Instead, before class, there will be a short, pre-recorded lecture (avg. = 30 minutes) posted on Perusall where you can play/pause and discuss with classmates and ask questions online. There will also be a short Q&A session when class session starts. During class sessions, the primary activity will be a team-based practicum to promote active learning: you will work in small groups either to analyze experiments or explore their properties through simulation. The main assignments out of class will be problem sets and a group “campus” experiment. Altogether, the aim is to explore each topic conceptually (verbally and graphically), analytically (in mathematical proofs), and practically. You will get four bites at each topic: in readings, recorded lectures, group-work during class, problem sets, and the campus experiment.

Assignments

I have included approximate grade breakdowns to help guide your thinking about the importance of different assignments.
1. **Lectures (~10%)**. You will watch lecture videos before class on Perusall and discuss questions about the lectures with your classmates. We will then have Q&A session at the beginning of each class to discuss common areas of interest.

2. **Readings (~15%)**. Readings from textbooks and other methodological sources are assigned each week along with one or more “applications” that will be used in groupwork. Readings are provided on Perusall to encourage active engagement through peer discussion.

3. **Groupwork (~25%)**. Students are expected to attend each class session and participate in group work during the class. We’ll need to get creative to enable groupwork virtually; we will divide up into Zoom breakout groups and we suggest one rotating member share their screen and the group talks through it while also working separately on their own screen. Virtual groupwork is not ideal, but we think it is still better than the alternatives. The group will upload their completed RMarkdown document by the following Sunday night at 5 p.m. We will post solutions at that time.

4. **Problem sets (~25%)**. There will be several problem sets drawing on problems from the Gerber and Green textbook (note they will be difficult or impossible to complete if you have not read the relevant chapter!).

   - You can (and should!) Google, read Stack Overflow, and seek out online resources for help. You can copy-paste code from these resources, just remember to comment your code with the URL where you got it from (this is good practice too, in order to remember where you got it!). Grabbing code from these resources is a key part of how social scientists do data analysis.
   - Work in groups is permitted, but you must note the name of each person you collaborated with for each question. Failure to do so will be treated as a violation of the plagiarism policy.

5. **Campus field experiment (~25%)**. In teams, you will design, conduct, and analyze a field experiment “at UCLA” (online given COVID) as the course project. Further details will be provided in Week 1.

*(Self-)evaluation*

There is little high-quality evidence that grading assignments and exams helps students learn, and some evidence grading is harmful.

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1 I draw on Jessica Calarco and Jesse Stommel’s ideas on “ungrading.”
Instead, you will evaluate yourself at several points during the quarter, in terms of your effort and your learning. In addition, you will evaluate each other within your campus experiment groups.

Your own evaluation, and the evaluation of you by your peers, will form the basis of your final grade. You will be provided with your peer evaluations at each point, and you will decide how to incorporate those into your evaluation. I reserve the right to change your grade, up or down, at the end of the quarter if I do not agree with your self-assessment (I will rely on the approximate breakdowns listed in the assignment section in making my own assessment). If I do decide to make a change, I will meet with you to talk about your performance before making a final decision.

Auditing: in my experience, auditing a class like this without completing the assignments will not be productive for you, so auditors will not be permitted. I encourage you to take the course for credit!

Learning during COVID²

This class is taking place during extraordinary times, in which learning may understandably not be your only or even top priority. You most likely are close with people who have been directly impacted by the COVID-19 virus or who have lost their jobs. You may also have experienced a change in personal circumstances that directly impacts your ability to focus on your academic work. Many of us have increased work and family care responsibilities and less-than-optimal work environments.

I am committed to making sure that you learn everything you were hoping to learn from this class! I will make whatever accommodations I can to help you finish your problem sets, do well on the project, and learn and understand the class material.

Given these circumstances, I hope to establish a learning community based on empathy about our varied circumstances during this time. If you tell me you’re having trouble, I will not judge you or think less of you. I hope you’ll extend me the same courtesy.

To this end: You never owe me personal information about your health (mental or physical). You are always welcome to talk to me about things that you are going through, though. If I am unable to help you myself, I will help you find the resources on or off campus that you need.

I want you to learn lots of things from this class, but I primarily want you to stay healthy, balanced, and grounded during this crisis.

² Adapted from Andrew Heiss’s words.
**Getting help**

This course is a lot of work! The group-work and problem sets are motivated by the idea that the most effective way to learn this material is to do it yourself. This means if you get behind, it will be hard to catch up. We don’t want this to happen!

We encourage you to take advantage *early and often* of three resources: Graeme's office hours, the TA’s office hours, and the discussion board. We are here to help, and want everyone to succeed in the course.

The discussion board allows all students to benefit from the discussion and to help each other understand the materials. Both students and instructors are encouraged to participate in discussions and answer any questions that are posted. You should operate on the principle “if I have a question, everyone else is unsure too.”

**Prerequisites**

This course assumes familiarity with the statistics at the level of Political Science 200B (Regression for Social Science), which may be met through courses in some other disciplines. Students who did not take the methods sequence in political science can contact me before enrolling in the course to discuss their preparation.

**Computation**

The course assumes intermediate familiarity with the R statistical environment and involves substantial use of R in most class sessions. Problem sets must be completed using R and RMarkdown. You should be familiar with the *tidyverse* family of R packages, with writing functions, with loops, with data transformation using dplyr, and with visualizing data with ggplot. If you know R but not the *tidyverse*, I provide resources below to pick them up before class starts. If you have not used R in a course before, it will be very difficult for you to succeed in the course, so please contact me in advance before registering for the class.

**Students outside political science**

You are very welcome to take the class if you are not in political science! Students from Anderson, education, sociology, social welfare, and statistics have taken the course and succeeded. Some of these students found it helpful to first take earlier parts of the political science methods sequence (PS 200A and 200B and in some cases 200C). Others found that their own methods training was sufficient. I am happy to talk to you about your preparation. The *biggest barrier to success in the course seems to be experience with R* (see above). Advanced
undergraduates may take the course with permission from the instructor, but only if they have taken PS 200A-200C.

**Professional ethics**

You are subject in this class to UCLA’s academic honesty policies. You should not pass off others’ work, words, or code as your own (you can avoid this by liberally citing and when relevant including quotation marks or notes indicating what is directly taken from others; our greatest virtue is building off the past work of others). Data fabrication in the context of the group experiment would violate the policy. If you have questions about attribution of work or whether practices in the experiment violate the policy, get in touch with us to talk about it.

**Reading and resources**

*Research design and implementation:*

- Druckman, James, and Donald P. Green. 2020. *Handbook of Experimental Political Science*. Cambridge UP.
- Kapiszewski, Diana, Lauren M. MacLean, and Benjamin L. Read. 2015. *Field research in political science: Practices and Principles*. Cambridge UP.

*Software:*

- Grolemund, Garrett and Hadley Wickham. *R 4 Data Science*. (Free Web book.)
• DeclareDesign software primer
• tidyverse cheat sheets
• Compilation of R tutorials and resources
• RStudio R primers
• Useful software packages for experiments in R:
  ○ randomizr: easy-to-use common randomization schemes
  ○ estimatr: design-based estimators for experiments
  ○ blockTools: for constructing blocks/strata for block-randomized experiments
  ○ ri2: for conducting randomization inference

(I used to recommend DataCamp and obtain access to it for students in the course. I no longer do either, for reasons outlined in a BuzzFeed article.)

Selected recent experiments by UCLA faculty

UCLA is a hub of experimentation across the social sciences. Below is a list of recent experiments by faculty, who may be useful resources as you begin to think about running your own experiments.

- **Darin Christensen** (Public policy and political science)
  - Building Resilient Health Systems: Experimental Evidence from Sierra Leone and the 2014 Ebola Outbreak, working paper
  - Community-Based Crisis Response: Evidence from Sierra Leone's Ebola Outbreak, AEA Papers and Proceedings

- **Cesi Cruz** (Political science)
  - Buying Informed Voters: New Effects of Information on Voters and Candidates, working paper
  - Making policies matter: Voter responses to campaign promises, working paper

- **Magali Delmas** (Anderson and Institute of the Environment and Sustainability)
  - Information strategies for energy conservation: A field experiment in India, Energy Economics
  - What Can We Learn from High Frequency Appliance Level Energy Metering? Results from a Field Experiment, Energy Policy

- **Jana Gallus** (Anderson)
  - Fostering public good contributions with symbolic awards: A large-scale natural field experiment at Wikipedia, Management Science
  - Recognition Incentives for Internal Crowdsourcing: A Field Experiment at NASA, working paper

- **Erin Hartman** (Political science and statistics)
  - Covariate Selection for Generalizing Experimental Results: Application to Large-Scale Development Program in Uganda, working paper
- From SATE to PATT: combining experimental with observational studies to estimate population treatment effects, *Journal of the Royal Statistical Society: Series A*

- **Chad Hazlett** (Political science and statistics)
  - Kernel Balancing: A flexible non-parametric weighting procedure for estimating causal effects, *Statistica Sinica*
  - A Persuasive Peace: Syrian refugees' attitudes towards compromise and civil war termination, *Journal of Peace Research*

- **Efrén Pérez** (Political science and psychology)
  - “Language influences mass opinion toward gender and LGBT equality,” *Proceedings of the National Academy of Science*

- **Dan Posner** (Political science)
  - The Weakness of Bottom-Up Accountability: Experimental Evidence from the Ugandan Health Sector, working paper

- **Manisha Shah** (Public policy)
  - Scaling Up Sanitation: Evidence from an RCT in Indonesia, *Journal of Development Economics*

- **Lynn Vavreck** (Political science)
  - Persuasive Effects of Presidential Campaign Advertising: Results of 53 Real-time Experiments in 2016, *Science Advances*
  - Does Product Placement Change Television Viewers’ Social Behavior? *Plos ONE*

- **Sherry Wu** (Anderson)
  - Having a voice in your group: Increasing productivity through group influence, working paper
  - Participatory practices at work change attitudes and behavior toward societal authority and justice, *Nature Communications*

*Field experiments by UCLA political science Ph.D. graduates (* UCLA PhD with Web site links)*

Many UCLA Ph.D.s have conducted experiments during graduate school, some as part of their dissertation work and others with faculty at UCLA and other institutions. The list would be very long. Below is a list of field experiments with links to their Web sites so you can see how these experiments fit into their research portfolio. (Let me know if you know of one that is missing.)


**Tentative topics and readings schedule**

Lectures and groupwork assume you have read all of the listed readings before class each week, unless marked as “optional.” All readings are on Perusall (and you are required to read them
there, in order to foster discussion with your colleagues.) I encourage you to read the applications more than once before you come to class.

0. Data analysis in R review

- Read and complete exercises for R 4 Data Science Part I
- Complete all six RStudio R primers

1. Why experiment?

- RRE ch. 2; FEDAI chs. 1-2

2. Random assignment procedures

- RRE ch. 4; FEDAI ch. 3

3. Research partnerships

- JPAL Building relationships and assessing viability guide
- RRE ch. 1
- R3DR partnerships chapter

4. Ethics in experimentation

- Complete the CITI human subjects training if you have not already (required for doing any human subjects research at UCLA) and upload your certificate to Moodle.
- Read ethics guidelines from the American Political Science Association, or if you are in another field, find your professional association’s guidelines.
- Principles:

- Applications (read Willis and choose one other, be prepared to discuss your ethical judgement of the paper based on the principles articles):
  ○ Adam Kramer, David Guillory, and Jeffrey Hancock. “Experimental evidence of massive-scale emotional contagion through social networks.” *Proceedings of the National Academy of Sciences*.

5. Analyzing experimental data

- FEDAI ch. 4
- Alexander Coppock. “Visualize as You Randomize: Design-Based Statistical Graphs for Randomized Experiments.” In *Cambridge Handbook of Experimental Political Science* (Druckman and Green, eds.).
- Application: Lauren Young. “The psychology of state repression: Fear and dissent decisions in Zimbabwe.” *American Political Science Review*.

6. Diagnosing experimental designs

- R3DR Part I
- [DeclareDesign software primer](#)

7. Outcome measurement and experiments for descriptive inference

- RRE ch. 5

I encourage you to read all of the below. However, for class, you may choose one section and read all of the papers, which are closely linked.
• When and how to measure outcomes:
  o David Broockman, Joshua L. Kalla, and Jasjeet S. Sekhon. “Field experiments with survey outcomes.” In *Cambridge Handbook on Experimental Political Science.* (Druckman and Green, eds.).

• Experiments for studying sensitive questions:

• Audit experiments:
  o Alexander Coppock. “Avoiding Post-Treatment Bias in Audit Experiments.” *Journal of Experimental Political Science.*

• Conjoint experiments:
  o Kirk Bansak, Jens Hainmueller, Daniel J. Hopkins, and Teppei Yamamoto. “Conjoint Survey Experiments.” In *Cambridge Handbook of Advances in Experimental Political Science* (Druckman and Green, eds.).
8. Heterogeneous treatment effects

- FEDAI ch. 9

9. Sampling units and generalizability

- Thompson ch. 2, 6, and 11-13.
- Erin Hartman. “Generalizability in Experiments.” In Cambridge Handbook of Experimental Political Science (Druckman and Green, eds.).

10. Noncompliance with treatments

- FEDAI chs. 5-6

11. Attrition (missing outcome data)

- FEDAI ch. 7

12. Interference and spillovers

- FEDAI ch. 8
Further reading:
• Aronow, Peter, Dean Eckles, Cyrus Samii, Stephanie Zonszein. “Spillover effects in experimental data.” In Cambridge Handbook of Experimental Political Science (Druckman and Green, eds.).

13. Theory and experimentation

• FEDAI ch. 10
• D3RD model chapter
• Anna Wilke and Macartan Humphreys. “Field experiments, theory, and external validity.” Book chapter.