DRAFT: PS 200E: Experimental Design for Social Science

Fall 2020

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Office hours: MW 11:30-12:30pm PST (on Zoom)

TA: TBD
Office hours: TBD

Class sessions: MW 9-10:50am PST

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 you will learn

We will read methodological works and published experiments, and to promote active engagement with the readings we will use the Perusall reading discussion platform. Before class, there will be a pre-recorded lecture (avg. = 30 minutes), also on Perusall. To promote active learning during class itself, there will be a practicum: you will work in small groups either to analyze experiments or explore their properties through simulation. There are two sets of outside-class assignments: problem sets once a week and a “campus” field 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

1. *Lectures.* 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.* 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.* Students are expected to attend each class session and participate in group work during the class. The group will upload their completed RMarkdown document by the following Sunday night at 5 p.m. We will post solutions at that time. You must include the names of the students in the group in the document.

4. *Problem sets.* There will be a short problem set every week 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!).

- 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. You may not collaborate with students not enrolled in the course.
- 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.
- Problem sets should be submitted to the Moodle before the beginning of the Thursday class of the due date. You must submit the RMarkdown and the compiled .pdf or a note indicating that you could not compile the document.

5. *Campus field experiment.* 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[1]

There is little high-quality evidence that grading assignments and exams motivates students to learn, and some evidence of harm.

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 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. But if I do, I will meet with you to talk about your performance before making a final decision.

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

Learning during COVID[2]

This class is taking place during extraordinary times, in which learning may understandably not be your only or even top priority. You most likely know people who have lost their jobs, have tested positive for COVID-19, have been hospitalized, or perhaps have even died. You all have increased (or possibly decreased) work responsibilities and increased family care responsibilities — you might be caring for extra people (young and/or old!) right now.

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.

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. 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.

[1] I draw on Jessica Calarco's ideas on "ungrading" here.
[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.

Resources

Primary text for the course:

- Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation.* New York: W.W. Norton. Abbreviation: FEDAI.

Additional references on design and implementation:

- Blair, Graeme, Jasper Cooper, Alexander Coppock, and Macartan Humphreys. *Research Design: Declare, Diagnose, Redesign*. Manuscript. Abbreviation: R3DR.
- Glennerster, Rachel, and Kudzai Takavarasha. 2013. *Running Randomized Evaluations: A Practical Guide.* Princeton: Princeton UP. Abbreviation: RRE.
- Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura B. Rawlings, Christel M. J. Vermeersch. *Impact Evaluation in Practice*. World Bank. (Free PDF.)
- Druckman, James, and Donald P. Green. 2020. *Handbook of Experimental Political Science*. Cambridge UP.
- Banerjee, Abhijit Vinayak, and Esther Duflo. 2017. *Handbook of Economic Field Experiments*. North-Holland.
- Thompson, Steven K. 2012. *Sampling*. Wiley. Third ed.
- Karlan, Dean, and Jacob Appel. 2017. *Failing in the Field: What We Can Learn When Field Research Goes Wrong.* Princeton UP.
- Sriram, Chandra Lekha, John C. King, Julie A. Mertus, Olga Martin-Ortega, Johanna Herman. 2009. *Surviving Field Research: Working in Violent and Difficult Situations*.
- Krause, Peter, and Ora Szekely, eds. 2020. *Stories from the Field: A Guide to Navigating Fieldwork in Political Science*. Columbia UP.
- Kapiszewski, Diana, Lauren M. MacLean, and Benjamin L. Read. 2015. *Field research in political science: Practices and Principles.* Cambridge UP.

Additional references on 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

These folks may be useful to know when proposing a dissertation or looking for research assistance opportunities (the best way to learn how to do your own field experiment after this class is to work on someone else's!).

- 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
- 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 experi- mental 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)

    - Does Perceiving Discrimination Influence Partisanship among Immigrant Minorities? Evidence from Five Experiments, *Journal of Experimental Political Science*
    - "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
    - Why Does Ethnic Diversity Undermine Public Goods Provision? *American Political Science Review*
- 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 political science 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. That 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.)

- Ryan Enos (Harvard)*. 2014 "Causal Effect of intergroup contact on exclusionary attitudes." *Proceedings of the National Academy of Sciences.*
- Ryan Enos (Harvard)* and Anthony Fowler. 2014. "Pivotality and Turnout: Evidence from a Field Experiment in the Aftermath of a Tied Election." *Political Science Research and Methods.*
- Jessica Preece (BYU)* and Olga Bogach Stoddard. 2015. "Does the Message Matter? A Field Experiment on Political Party Recruitment." *Journal of Experimental Political Science.*

- Christpher F. Karpowitz, J. Quin Monson, and Jessica Robinson Preece (BYU)*. 2017. "How to Elect More Women: Gender and Candidate Success in a Field Experiment." *American Journal of Political Science.*
- Joseph Asunka (Hewlett Foundation)*, Sarah Brierley (LSE)*, Miriam Golden (former UCLA faculty), Eric Kramon (George Washington)*, and George Ofosu (LSE)*. 2017. "Electoral Fraud or Violence: The Effect of Observers on Party Manipulation Strategies." *British Journal of Political Science*.
- Claire Adida, Jessica Gottlieb, Eric Kramon (George Washington)*, and Gwyneth McClendon. 2017. "Reducing or Reinforcing In-Group Preferences? An Experiment on Information and Ethnic Voting", *Quarterly Journal of Political Science*.
- Ryan Enos (Harvard)*. 2017. *The Space Between Us: Social Geography and Politics*. Cambridge UP. Reports on field experiments Ryan conducted for his dissertation.
- Sarah Brierley (LSE)*, Eric Kramon (George Washington)*, and George Kwaku Ofosu (LSE)*. 2019. The Moderating Effect of Debates on Political Attitudes. *American Journal of Political Science*.
- George Kwaku Ofosu (LSE). 2019. Do Fairer Elections Increase the Responsiveness of Politicians? *American Political Science Review*.
- Claire Adida, Jessica Gottlieb, Eric Kramon (George Washington)*, and Gwyneth McClendon. 2019. "When Does Information Influence Voters? The Joint Importance of Salience and Coordination," *Comparative Political Studies*.
- Thad Dunning, Guy Grossman, Macartan Humphreys, Susan D. Hyde, Craig McIntosh, Gareth Nellis, Claire L. Adida, Eric Arias, Clara Bicalho, Taylor C. Boas, Mark T. Buntaine, Simon Chauchard, Anirvan Chowdhury, Jessica Gottlieb, F. Daniel Hidalgo, Marcus Holmlund, Ryan Jablonski, Eric Kramon (George Washington)*, Horacio Larreguy, Malte Lierl, John Marshall, Gwyneth McClendon, Marcus A. Melo, Daniel L. Nielson, Paula M. Pickering, Melina R. Platas, Pablo Querubín, Pia Raffler, and Neelanjan Sircar. 2019. "Voter Information Campaigns and Political Accountability: Cumulative Findings from a Pre-registered Meta-analysis of Coordinated Trials," *Science Advances*.
- Elizabeth Carlson* (Penn State) and Brigitte Seim. 2020. "Honor among Chiefs: An Experiment on Monitoring and Diversion Among Traditional Leaders in Malawi." *Journal of Development Studies*.

Tentative topics and readings schedule

I will assume you have read all of the listed readings before class each week, unless marked as "optional."

You will find the group work difficult or impossible if you have not first read the "application" paper(s) assigned in most weeks. *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
- *Application:* Karpowitz, Christopher F., J. Quin Monson, Jessica Robinson Preece. 2017. "How to Elect More Women: Gender and Candidate Success in a Field Experiment." *American Journal of Political Science.*

2. Random assignment procedures

- RRE ch. 4; FEDAI ch. 3
- Application: Blair, Graeme, Rebecca Littman, and Elizabeth Levy Paluck. "Motivating the adoption of new community-minded behaviors: An empirical test in Nigeria." *Science Advances*.

3. Research partnerships

- TBD

4. Ethics in experimentation

In class: ethics exercise

- 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:
    - Humphreys, Macartan. 2015. "Reflections on the Ethics of Social Experimentation." *Journal of Globalization and Development*.
    - Teele, Dawn. 2014. "Reflections on the Ethics of Field Experiments." in Teele, ed., *Field Experiments and their Critics.*
    - Slough, Tara. 2020. "The Ethics of Electoral Experimentation: Design-Based Recommendations." Working paper.
    - Michelitch, Kristin, ed. 2018. *Symposium: Who Research Is It? Notable Ways Political Scientists Impact the Communities We Study*. PS: Political Science & Politics.
- Applications (read Willis and choose one other, be prepared to discuss your ethical judgement of the paper based on the principles articles):
    - Willis, Derek. 2015. "Professors' Research Project Stirs Political Outrage in Montana*." New York Times*.
    - Kramer, Adam, David Guillory, and Jeffrey Hancock. "Experimental evidence of massive-scale emotional contagion through social networks." *Proceedings of the National Academy of Sciences*.
    - Coville, Aidan, Sebastian Galiani, Paul Gertler, and Susumu Yoshida. "Enforcing Payment for Water and Sanitation Services in Nairobi's Slums." NBER Working Paper. Also read the authors' ethics commentary.
    - Cantoni, Davide, David Yang, Noam Yuchtman, Jane Zhang. "Protests as Strategic Games: Experimental Evidence from Hong Kong's Antiauthoritarian Movement." *Quarterly Journal of Economics*.

5. Analyzing experimental data

- FEDAI ch. 4
- Coppock, Alexander. "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

Note: for this module, I encourage you to read all of the readings below. However, for class, you may choose one section and read all of the papers, which are closely linked.

- RRE ch. 5
- When and how to measure outcomes:
    - David McKenzie. "Beyond baseline and follow-up: The case for more T in experiments." *Journal of Development Economics*.
    - Broockman, David, Joshua L. Kalla, and Jasjeet S. Sekhon. 2017. "The Design of Field Experiments With Survey Outcomes: A Framework for Selecting More Efficient, Robust, and Ethical Designs." *Political Analysis.*
    - Erik Peterson, Sean J. Westwood, and Shanto Iyengar. "Beyond Attitudes: Incorporating Measures of Behavior in Survey Experiments." In *Cambridge Handbook on Experimental Political Science.* (Druckman and Green, eds.).
- Experiments for studying sensitive questions:
    - Blair, Graeme, Alexander Coppock, and Margaret Moor. 2020. "When to Worry about Sensitivity Bias." *American Political Science Review.*
    - Rosenfeld, Bryn, Kosuke Imai, and Jacob Shapiro. 2016. "An Empirical Validation Study of Popular Survey Methodologies for Sensitive Questions." *American Journal of* Political Science.
    - Eric Kramon and Keith Weghorst. 2019. "(Mis)Measuring Sensitive Attitudes with the List Experiment: Solutions to List Experiment Breakdown in Kenya." Public Opinion Quarterly.
- Audit experiments:
    - White, Ariel, Noah Nathan, and Julie Faller. "What Do I Need to Vote? Bureaucratic Discretion and Discrimination by Local Election Officials." *American Political Science Review*.
    - Marianne Bertrand and Sendhil Mullainathan. "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination." *American Economic Review*.
    - Daniel M. Butler and Charles Crabtree. "Moving Beyond Measurement: Adapting Audit Studies to Test Bias-Reducing Interventions." *Journal of Experimental Political Science*.
    - Alexander Coppock. "Avoiding Post-Treatment Bias in Audit Experiments." *Journal of Experimental Political Science*.
- Conjoint experiments:

- 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.).
- Jens Hainmueller, Dominik Hangartner, and Teppei Yamamoto. "Validating vignette and conjoint survey experiments against real-world behavior." *Proceedings of the National Academy of Sciences*.
- Scott F. Abramson, Korhan Koçak, and Asya Magazinnik. "What Do We Learn About Voter Preferences From Conjoint Experiments?" Working paper.
- Bansak, Kirk, Jens Hainmueller, Dan Hopkins, and Teppei Yamamoto. "Using Conjoint Experiments to Analyze Elections: The Essential Role of the Average Marginal Component Effect (AMCE)." Working paper.

8. Heterogeneous effects

- FEDAI ch. 9
- Coppock, Alexander, Thomas J. Leeper, and Kevin J. Mullinix. 2018. "The Generalizability of Heterogeneous Treatment Effect Estimates Across Samples." Proceedings of the National Academy of Science.
- *Application:* Michelitch, Kristin. 2015. Does Electoral Competition Exacerbate Interethnic or Interpartisan Economic Discrimination? Evidence from a Field Experiment in Market Price Bargaining. *American Political Science Review*.
- *Application:* Valenzuela, Ali A., and Melissa R. Michelson. "Turnout, status, and identity: Mobilizing Latinos to vote with group appeals." *American Political Science Review*.

9. Sampling units and generalizability

- Thompson ch. 2, 6, and 11-13.
- Egami, Naoki, and Erin Hartman. "Elements of External Validity: Framework, Design, and Analysis." Working paper.
- Hartman, Erin. "Generalizability in Experiments." In *Cambridge Handbook of Experimental Political Science* (Druckman and Green, eds.).
- *Application:* Dunning, Thad, Guy Grossman, Macartan Humphreys, Susan D. Hyde, Craig McIntosh, Gareth Nellis, et al. "Voter information campaigns and political accountability: Cumulative findings from a preregistered meta-analysis of coordinated trials." *Science Advances*.

10. Noncompliance with treatments

- FEDAI chs. 5-6

- *Application:* Roee Levy. 2020. "Social Media, News Consumption, and Polarization: Evidence from a Field Experiment." Working paper.

11. Attrition (missing outcome data)

- FEDAI ch. 7
- *Application:* Beath, Andrew, Fotini Christia, Georgy Egorov, Ruben Enikolopov. 2016. "Electoral Rules and Political Selection: Theory and Evidence from a Field Experiment in Afghanistan," *The Review of Economic Studies*.

12. Interference and spillovers

- FEDAI ch. 8
- *Application:* Sinclair, Betsy, Margaret McConnell and Donald Green. 2012. "Detecting Spillover Effects: Design and Analysis of Multilevel Experiments." *American Journal of Political Science*.

13. Theory and experimentation

- FEDAI ch. 10, D3RD model chapter
- Samii, Cyrus. "Causal empiricism in social science research." *Journal of Politics.*
- Wilke, Anna, and Macartan Humphreys. "Field experiments, theory, and external validity." Book chapter.
- *Application:* Gulzar, Saad, and Muhammad Yasir Khan. "Barriers to Political Entry: Experimental Evidence from Local Government Elections in Pakistan." Working paper.