PS 200E: Experimental Design for Social Science

Graeme Blair

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Contact information

	Graeme Blair (Instructor)	Caleb Ziolkowski (TA)
Office:	3347 Bunche Hall	Grad. Office
Office hours:	Tues. 9-11:30 a.m.	TBD
Email:	graeme.blair@ucla.edu	cziolk01@g.ucla.edu
URL:	graemeblair.com	

Schedule

- Class sessions: Tues. and Thurs. 12:15-1:55 p.m. (Bunche 4357)

Course description

This course covers the design, implementation, and analysis of experiments in the social sciences. In class, there will be a lecture component and a practicum in which you will work in small groups to analyze experiments or explore their properties through simulation. The aim is to explore each topic conceptually (verbally and graphically), analytically (in mathematical proofs), through simulation, and through data analysis of a real experiment. You will get three bites at each topic: in lecture, group-work during class, and problem sets.

Course objectives

- Learn about important design concerns for experiments, and how to address them by design
- Learn how to implement key components of experimental designs in code
- Learn how to assess design choices in your own experiments through simulation
- Gain experience replicating the design and analysis of prominent experiments

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. The problem sets must be completed using `R` and RMarkdown. If you have not used `R` in a course before, please contact me before enrolling in the course. There will be an `R` review session in the first course meeting (it will not be a sufficient introduction if you have not used `R` in a course before).

Each session of the course will include a practical session in small groups. Bring your laptop with RStudio and the `tidyverse` family of packages installed and be ready to code.

Course requirements

1. **Problem sets.** 40% of grade. There will be a short problem set most weeks, largely drawing on problems from the Gerber and Green textbook (note this should be a good encouragement to read the text each week!).
    - 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. A printout of the PDF created by RMarkdown should be submitted in person in class.
    - Problem sets submitted after the deadline will not be accepted. However, during the busy quarter, something always comes up for each of us. You can select one freebie problem set and have its grade dropped.
2. **Attendance and participation in groupwork.** 10% of grade (based on completion of 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 at the end of class (it will not be graded besides noting it was completed).
3. **Mini-experiment.** 10% of grade. You will design, conduct, and analyze a small experiment that does not use human subjects in the middle of the course. Further details will be provided in Week 1.
4. **Takehome midterm exam**. 20% of grade. Covers all material up to this point. Due October 31 before class (12:15pm). No problem set will be due that week.
5. **Final exam**. 20% of grade. Covers all material in the course. Due the last day of finals week, Friday Dec. 13, at 12 p.m.

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!

Getting help

This course is a lot of work! The group-work and problem sets are motivated by the idea that the most effect way to learn this material is to do it yourselves. This means if you get behind, it will be hard to catch up. We encourage you to take advantage *early and often* three resources: Graeme's office hours, Caleb's office hours, and the Moodle discussion board. We are here to help, and want everyone to succeed in the course.

The Moodle 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."

Books

Primary texts for the course:

- Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation.* New York: W.W. Norton. Abbreviation: FEDAI.
- Glennerster, Rachel, and Kudzai Takavarasha. 2013. *Running Randomized Evaluations: A Practical Guide.* Princeton: Princeton UP. Abbreviation: RRE.

Additional references available for free online:

- R 4 Data Science book
- Evidence in Governance and Politics methods guides
- DeclareDesign software primer

Tentative lecture topics and readings schedule

I will assume you have read all of the assigned readings before class each week. You will find the group work difficult or impossible if you have not first read the experiment paper assigned (one is assigned most weeks). I encourage you to read it more than once before you come to class.

Papers without links below will be posted on Moodle.

0. Data analysis in R review session
    - Review R 4 Data Science book https://r4ds.had.co.nz
1. Why experiment?
    - RRE ch. 2; FEDAI chs. 1-2
    - **Application:** Broockman, David, and Joshua Kalla. "Durably reducing transphobia: A field experiment on door-to-door canvassing." *Science*.
2. Random assignment procedures
    - RRE ch. 4; FEDAI ch. 3
    - **Application:** Graeme Blair, Rebecca Littman, and Elizabeth Levy Paluck. "Motivating the adoption of new community-minded behaviors: An empirical test in Nigeria." *Science Advances*.

3. Ethics in experimentation
    - Draft American Political Science Ethics Guidelines. Also read a short background.
    - Humphreys, Macartan. "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.*
    - McClendon, Gwyneth. 2012. "Ethics of using public officials as field experiment subjects." *Newsletter of the APSA Experimental Section*.
    - 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.*
    - Cantoni, Davide, David Yang, Noam Yuchtman, Jane Zhang. "Protests as Strategic Games: Experimental Evidence from Hong Kong's Antiauthoritarian Movement." *Quarterly Journal of Economics*.

4. Analyzing experimental data
    - FEDAI ch. 4
    - **Application:** Lauren Young. "The psychology of state repression: Fear and dissent decisions in Zimbabwe." *American Political Science Review*.
    - **Application:** Ana de la O. "Do Conditional Cash Transfers Affect Electoral Behavior? Evidence from a Randomized Experiment in Mexico." *American Journal of Political Science*.
    - Coppock, Alexander. "Visualize as You Randomize: Design-Based Statistical Graphs for Randomized Experiments." In *Cambridge Handbook of Experimental Political Science* (Druckman and Green, eds.). Available on Moodle.

5. Diagnosing research designs
    - Blair, Graeme, Jasper Cooper, Alexander Coppock, and Macartan Humphreys. "Declaring and Diagnosing Research Designs." *American Political Science Review*.
    - DeclareDesign software primer

6. Outcome measurement
    - RRE ch. 5
    - David McKenzie. "Beyond baseline and follow-up: The case for more T in experiments." *Journal of Development Economics.*
    - Experiments for studying sensitive questions:
        - Blair, Graeme, Alexander Coppock, and Margaret Moor. "When to Worry about Sensitivity Bias." Working paper.
        - Rosenfeld, Bryn, Kosuke Imai, and Jacob Shapiro. (2016). "An Empirical Validation Study of Popular Survey Methodologies for Sensitive Questions." *American Journal of Political Science*.
    - 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.
- Behavioral measures:
  - 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.). Available on Moodle.

7. Heterogeneous effects
   - FEDAI ch. 9
8. Sampling units and generalizability
   - Thompson ch. 2, 6, and 11-13.
   - Hartman, Erin. "Generalizability in Experiments." In *Cambridge Handbook of Experimental Political Science* (Druckman and Green, eds.). Available on Moodle.
9. Noncompliance
   - FEDAI chs. 5-6
10. Attrition
    - FEDAI ch. 7
11. Interference
    - FEDAI ch. 8
    - Ichino, Nahomi, and Matthias Schündeln. 2012. "Deterring or Displacing Electoral Irregularities? Spillover Effects of Observers in a Randomized Field Experiment in Ghana." *Journal of Politics*.
    - Sinclair, Betsy, Margaret McConnell and Donald Green. 2012. "Detecting Spillover Effects: Design and Analysis of Multilevel Experiments." *American Journal of Political Science*.
12. Causal mechanisms
    - FEDAI ch. 10