PS 200E: Experimental Design for Social Science

Graeme Blair

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Contact Information

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Schedule

- Lectures: TTh 5-6:15pm (T Bunche 4357; Th Humant A40)
- Section: TBD

Course description

This course covers the design, analysis, and implementation of experimental research in the social sciences.

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 of causal inference at the level of Political Science 200C (Causal Inference for Social Science). Students who did not take the methods sequence in political science should 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 and the final project must be completed using `R` and RMarkdown. If you have not used `R` in a course before, contact me before enrolling in the course.

Section

In section, you will apply what you learned in lecture and build on it by coding functions yourself and conducting simulations. Bring your laptop with RStudio installed and be ready to code.

Course requirements

1. **Problem sets.** 25% of grade. There will be a short problem set most weeks, many drawing on problems from Gerber and Green.

   - 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.
   - Problem sets submitted after the deadline will not be accepted.

2. **Attendance.** Students are expected to attend each class and section every week.

3. **Participate in the Moodle discussion board.** Post questions and regularly post answers to your peers' questions.

4. **Mini-experiment.** 10% of grade. (Due February 22.) 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 2.

5. **Midterm exam**. 30% of grade. February 15 in-class.

6. **Replication project.** 35% of grade.

   a. Pick a study and submit to the online form. Due January 15. (5pts).
   b. Replicate the main finding using their data. Due as a "replication proposal" January 30. (25pts).
   c. Replicate their design and evaluate whether it was a good design, and what you would have done differently. Due March 8. (35pts)
   d. Final writeup is the registered report of your replication of the experiment. Due March 23. (35pts).

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 except by special permission. I encourage you to take the course for credit!

Questions and announcements

In addition to precepts and office hours, please use the Moodle discussion board when asking questions about lectures, problem sets, and other course materials.

This 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.

Books

Primary books the course will rely on:

- 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.

Lecture topics and readings

Required readings are noted *.

1. Why experiment?

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

2. Assignment procedures

    - * RRE ch. 4; FEDAI ch. 3

3. Analyzing experimental data

    - * FEDAI ch. 4

4. Sampling units and generalizability

    - * Thompson ch. 2, 6, and 11-13.
    - Hartman et al. 2015. "From SATE to PATT: Combining Experimental with Observational Studies to Estimate Population Treatment Effects". *Journal of the Royal Statistical Society, Series A.*
    - Abadie, Alberto, Susan Athey, Guido Imbens, and Jeffrey Wooldridge. 2017. "When Should You Adjust Standard Errors for Clustering?"

5. Outcome measurement

    - * RRE ch. 5
    - * Mackenzie, David. "Beyond Baseline and Follow-up: The Case for More T in Experiments." World Bank working paper.

6. Declaring the elements of a research design

    - * Blair, Graeme, Jasper Cooper, Alexander Coppock, and Macartan Humphreys. 2017. "A general framework for learning about research designs." Working paper.
    - * **Find an experiment that you admire and bring it to class.**

7. What is a good experimental design?

8. Moderators and heterogeneous effects

- • * FEDAI ch. 9

9. Ethics in experimentation

   - • * Humphreys, Macartan. "Reflections on the Ethics of Social Experimentation." *Journal of Globalization and Development* 6(1): 87-112.
   - • * Teele, Dawn. 2014. "Reflections on the Ethics of Field Experiments." in Teele, ed., *Field Experiments and their Critics.*

10. Noncompliance and what to do about it

   - • * FEDAI chs. 5-6

11. Attrition and what to do about it

   - • * FEDAI ch. 7
   - • * Coppock, Alexander, Alan S. Gerber, Donald P. Green, and Holger L. Kern. "Combining Double Sampling and Bounds to Address Non-Ignorable Missing Outcomes in Randomized Experiments." *Political Analysis.*

12. Exploiting interference by design

   - • * 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* 74(1): 292-307.
   - • * Sinclair, Betsy, Margaret McConnell and Donald P. Green. 2012. "Detecting Spillover Effects: Design and Analysis of Multilevel Experiments." *American Journal of Political Science*, Vol. 56, No. 4 (October 2012), pp. 1055-1069
   - • Chen, Jiehua, Macartan Humphreys, Vijay Modi. 2010. "Technology Diffusion and Social Networks: Evidence from a Field Experiment in Uganda. Working paper.

13. Studying causal mechanisms

   - • * FEDAI Ch. 10
   - • * Imai, Kosuke, Luke Keele, Dustin Tingley, and Teppei Yamamoto. (2011). "Unpacking the Black Box of Causality: Learning about Causal Mechanisms from Experimental and Observational Studies." American Political Science Review, Vol. 105, No. 4 (November), pp. 765-789.
   - • * Imai, Kosuke, Dustin Tingleny, and Teppei Yamamoto. (2013). "Experimental Designs for Identifying Causal Mechanisms." *Journal of the Royal Statistical Society, Series A (Statistics in Society)*, Vol. 176, No. 1 (January), pp. 5-51.
   - • Bullock, John G., Donald P. Green, and Shang E. Ha. 2010. "Yes, But What's the Mechanism? (Don't Expect an Easy Answer)." Journal of Personality and Social Psychology 98 (April): 550-58.

14. Registration and reporting on experiments

   - • *Franco, Annie, Neil Malhotra, and Gabor Simonovits. 2014. "Publication bias in the social sciences: Unlocking the file drawer." *Science* 345(6203): 1502-1505.
   - • * Humphreys, Macartan, Raul de la Sierra and Peter van der Windt. 2013. "Fishing, Commitment, and Communication: A Proposal for Comprehensive Nonbinding Research Registration." *Political Analysis* 21 (1): 1-20.

- * Olken, Benjamin A. 2015. "Promises and Perils of Pre-Analysis Plans." *Journal of Economic Perspectives* 29(3): 61-80.
- * Green, Donald and Winston Lee. 2016. "Standard Operating Procedures." *Perspectives on Politics*.
- Findley, Michael G., Nathan M. Jensen, Edmund J. Malesky, and Thomas B. Pepinsky. 2016. "Can Results-Free Review Reduce Publication Bias? The Results and Implications of a Pilot Study." *Comparative Political Studies*. (Special issue).
- CONSORT guidelines