Experimentation and Causal Inference

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The purpose of this course is to introduce and elaborate identification–oriented research methods, particularly experimentation, and their use in the social sciences. While this course could be taught in a number of different ways, the focus here is on delivering a breadth of substantive research topics and methodological considerations that emerge in experimentation. The course also touches on quasi-experimental research methods for causal inference and is bookended by discussions about the nature of causation and alternative means of inferring causal relationships. The course will also address issues in the analysis and reporting of experimental research, such as matters of validity, mediation and moderation, treatment noncompliance, and the use of covariates. Students will leave the course with a deep and broad understanding of experimental design, along its challenges and opportunities. Students will design an experiment and associated plan of analysis and will have developed an ability to read experimental literature, as well as critique causal claims more broadly

There is an effort to touch on analysis of experiments, but this material is less central than consideration of causation per se, experimental design (as opposed to analysis), and the substantive topics that might be studied experimentally. A short unit on analysis is presented in the middle of the course. This, too, is done somewhat atypically. Rather than spending large portions of time on particular estimation techniques (i.e., difference-of-means, ANOVA, regression, permutation) the emphasis is on analytic considerations with some discussion of particular techniques. Those interested in particular techniques can reference any of the recommended textbook reading listed at the end of this section, or consult with the instructor.

1 Objectives

The learning objectives for the course are as follows. By the end of the course, students should be able to:

1. Explain the fundamental problem of causal inference and its implications for identifying causal relationships in the social sciences

2. Explain principles of construct validity, internal validity, external validity, and statistical conclusion validity with regard to experimental design, analysis, and reporting

3. Evaluate trade-offs in the design, analysis, and reporting of experimental research and explain the implications of experimental and non-experimental designs for drawing causal inferences

4. Apply methodological and substantive knowledge from the course to the design and analysis of an original experiment

2 Exam

The exam for the course consists of a take-home assignment on topic of student's choice. Specifically, students are asked to propose an experimental study on a relevant topic from any area of political science. The assignment must introduce the underlying research question (and associated constructs), use relevant empirical and theoretical literature to develop testable hypotheses, and then describe — in detail — an experimental design capable of addressing those hypotheses and thus providing insight into the research question. Furthermore, the assignment must detail:

- The design of the experiment and a discussion of how that design addresses the hypotheses and research question
- The proposed stimulus/treatment materials
- Exact measures of outcomes and covariates (along with justifications of those operationalizations)
- A complete "protocol" of how the experiment will be implemented, randomization conducted, and outcome measures assessed, along with a discussion of how any challenges in implementation will be addressed
- A planned statistical analysis that accounts for any possible data challenges
- Discussion of any concerns about the feasibility of the design and any ethical considerations
- Discussion of the external validity of the experiment and its contributions to relevant literature

The exam does not require students to implement their experiment, but they are welcome to do so. For those who do not implement their design, some simulated (fake) data should be created in order to demonstrate the proposed analysis.

The seminar will meet in-person for ten weeks, allowing for approximately one month of independent work on that assignment. Students will be expected to present a one-page synopsis of their assignment approximately half way through the semester (with one third of students presenting during each of weeks 13, 14, and 15). Appointment times will then be made available to meet one-on-one with the instructor to discuss a further developed version of the assignment (around week 20).

3 Reading Material

The assigned material for the course includes empirical articles on relevant topic and a textbook. All readings should be completed before their respective course meeting. **There is reading assigned on the first day.** The textbook for the course is:

– William R. Shadish, Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin, Boston, MA, 2001.

We will be reading most of the text, but not the chapters on non-experimental designs for causal inference. Those chapters may, however, prove helpful to you in designing experimental studies.

As a social researcher interested in causation, you may also find the following books helpful but none of them is require for this course. The Gerber and Green (2012) text is particularly helpful for understanding how to analyze experimental data and the Druckman et al. (2011) text includes literature reviews of nearly all areas of political science, which might supply some ideas for your own experiment.

– Alan S. Gerber and Donald P. Green. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton, 2012.

– Donald B. Rubin. *Matched Sampling for Causal Effects*. Cambridge University Press, New York, 2006.

– Stephen L. Morgan and Christopher Winship. *Counterfactuals and Causal Inference: Methods and Principles for Social Research*. Cambridge University Press, New York, 2007.

– Paul R. Rosenbaum. *Design of Observational Studies*. Springer, New York, 2009.

– Andrew Gelman and Jennifer L. Hill. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. Cambridge University Press, New York, 2006.

– Joshua D. Angrist and Jörn-Steffen Pischke. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press, Princeton, NJ, 2008.

– Rebecca B. Morton and Kenneth C. Williams. *Experimental Political Science and the Study of Causality: From Nature to the Lab*. Cambridge University Press, 2010.

– Diana C. Mutz. *Population-Based Survey Experiments*. Princeton University Press, Princeton, NJ, 2011.

– James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia. *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

4 Schedule

The general schedule for the course is as follows. Details on the readings for each week are provided on the following pages.

4.1 Introduction to Political Science Experiments (Feb 4)

4.2 Concepts, Research Questions, and Hypotheses (Feb 11)

4.3 Internal Validity and Experimental Design (Feb 18)

4.4 Analysis of Experiments (Feb 25)

4.5 Practical Issues and Challenges (Mar 4)

4.6 Examples: Laboratory Experiments (Mar 11)

4.7 Examples: Field Experiments (Mar 18)

4.8 Examples: Survey Experiments (Mar 25)

4.9 External Validity (Apr 8)

4.10 Effect Sizes, Meta-Analysis, Decision Making (Apr 15)

Note: Class will not meet on April 1.

4.1 Introduction to Political Science Experiments (Feb 4)

What are experiments? And why do we do them? How are they used in political science?

– Kosuke Imai, Gary King, and Elizabeth A. Stuart. Misunderstandings Between Experimentalists and Observationalists About Causal Inference. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 171(2):481–502, April 2008.

– Paul W. Holland. Statistics and Causal Inference. *Journal of the American Statistical Association*, 81(396):945–960, 1986.

– James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia. The Growth and Development of Experimental Research in Political Science. *American Political Science Review*, 100(4):627–635, 2006.

– Amos Tversky and Daniel Kahneman. The framing of decisions and the psychology of choice. *Science*, 211(4481):453–458, January 1981.

See Also:

–Chapter 14 from William R. Shadish, Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin, Boston, MA, 2001.

– Harold F. Gosnell. An Experiment in the Stimulation of Voting. *American Political Science Review*, 20(4):869–874, 1926.

– Carl I. Hovland. Reconciling Conflicting Results Derived from Experimental and Survey Studies of Attitude Change. *American Psychologist*, 14(1):8–17, 1959.

– Rose McDermott, Jonathan Cowden, and Cheryl Koopman. Framing, Uncertainty, and Hostile Communications in a Crisis Experiment. *Political Psychology*, 23(1):133–149, March 2002.

– Kurt Danziger. Making Social Psychology Experimental: A Conceptual History, 1920-1970. *Journal of the History of the Behavioral Sciences*, 36(4):329–47, January 2000.

– Rebecca B. Morton and Kenneth C. Williams. Experimentation in Political Science. In *Oxford Handbook of Political Methodology*, pages 339–356. Oxford University Press, New York, 2008.

– Shanto Iyengar. Laboratory Experiments in Political Science. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*, chapter 6. Cambridge University Press, New York, 2011.

– Alan S. Gerber. Field Experiments in Political Science. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

4.2 Concepts, Research Questions, and Hypotheses (Feb 11)

What kinds of questions can we answer with experiments? How do experiments test theories?

–Chapter 3 (up to p.82) from William R. Shadish, Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin, Boston, MA, 2001.

–Chapter 5 (107–140) from John Gerring. *Social Science Methodology: A Unified Framework*. Cambridge Univ Press, New York, 2012.

– Thomas J. Leeper. The Role of Protocol in the Design and Reporting of Experiments. *The Experimental Political Scientist*, 2(1), 2011.

– James N. Druckman and Kjersten R. Nelson. Framing and Deliberation: How Citizens' Conversations Limit Elite Influence. *American Journal of Political Science*, 47(4):729–745, October 2003.

See Also:
– Gary Goertz. *Social Science Concepts: A User's Guide*. Princeton University Press, Princeton, NJ, 2005.

– Robert Adcock and David Collier. Measurement Validity: A Shared Standard for Qualitative and Quantitative Research. *American Political Science Review*, 95(3):529–546, 2001.

4.3 Internal Validity and Experimental Design (Feb 18)

How do we design experiments effectively? How do we know that they "work"?

–Chapters 1–2 and 8 from William R. Shadish, Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin, Boston, MA, 2001.

– Benjamin Freedman. Equipoise and the Ethics of Clinical Research. *The New England Journal of Medicine*, 317(3):141–145, 1987.

– Look at examples of studies from TESS:
`http://www.tessexperiments.org/previousstudies.html`

See Also:

– Rose McDermott. Internal and External Validity. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

– William R. Shadish and Kristynn J. Sullivan. Theories of Causation in Psychological Science. Unpublished paper, 2010.

– Donald B. Rubin. Bayesian Inference for Causal Effects: The Role of Randomization. *Annals of Statistics*, 6(1):34–58, 1978.

– Paul R. Rosenbaum. *Design of Observational Studies*. Springer, New York, 2009.

– Charles F. Manski. *Identification Problems in the Social Sciences*. Harvard University Press, Cambridge, MA, 1999.

– Patrick W. Corrigan and Mark S. Salzer. The Conflict Between Random Assignment and Treatment Preference: Implications for Internal Validity. *Evaluation and Program Planning*, 26(2):109–121, May 2003.

4.4 Analysis of Experiments (Feb 25)

How do we analyze experiments? How do we detect causal effects?

– Donald B. Rubin. For Objective Causal Inference, Design Trumps Analysis. *The Annals of Applied Statistics*, 2(3):808–840, September 2008.

– Andrew Gelman and Hal Stern. The Difference Between 'Significant' and 'Not Significant' is not Itself Statistically Significant. *The American Statistician*, 60(4):328–331, November 2006.

– Howard S. Bloom. Minimum Detectable Effects: A Simple Way to Report the Statistical Power of Experimental Designs. *Evaluation Review*, 19(5):547–556, October 1995.

– Jerzy Splawa-Neyman. On the Application of Probability Theory to Agricultural Experiments. Essay on Principles. *Statistical Science*, 5(4):465–472, 1990.

See Also:

– Alan S. Gerber and Donald P. Green. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton, 2012.

– Charles F. Manski and Daniel S. Nagin. Bounding Disagreements About Treatment Effectcs: A Case Study of Sentencing and Recidivism. *Sociological Methodology*, 28(1):99–137, 1998.

– Jeff Gill. The Insignificance of Null Hypothesis Significance Testing. *Political Research Quarterly*, 52(3):647–674, 1999.

– Charles F. Manski. Nonparametric Bounds on Treatment Effects. *American Economic Review*, 80(2):319–323, 1990.

– David Moher, Corinne S. Dulberg, and George A. Wells. Statistical Power, Sample Size, and Their Reporting in Randomized Controlled Trials. *JAMA: The Journal of the American Medical Association*, 272(2):122–4, July 1994.

4.5 Practical Issues and Challenges (Mar 4)

What are the ethical and practical challenges we face in experimentation? What happens if we want to do the impossible? What happens when our experiments go awry?

–Chapters 9–10 and 14 from William R. Shadish, Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin, Boston, MA, 2001.

– James N. Druckman and Thomas J. Leeper. Learning More from Political Communication Experiments: Pretreatment and Its Effects. *American Journal of Political Science*, 56(4):875–896, February 2012.

– Ralph Hertwig and Andreas Ortmann. Deception in Experiments: Revisiting the Arguments in Its Defense. *Ethics & Behavior*, 18(1):59–92, March 2008.

See Also:

Measurement

– Stephen Ansolabehere, Jonathan Rodden, and James M. Jr. Snyder. The Strength of Issues: Using Multiple Measures to Gauge Preference Stability, Ideological Constraint, and Issue Voting. *American Political Science Review*, 102(02):215–232, June 2008.

– Brian J. Gaines and James H. Kuklinski. Treatment Effects. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*, chapter 31, pages 445–458. Cambridge University Press, New York, 2011.

Noncompliance

– Joshua D. Angrist, Guido W. Imbens, and Donald B. Rubin. Identification of Causal Effects Using Instrumental Variables. *Journal of the American Statistical Association*, 91(434):444–455, June 1996.

–Chapters 5–7 from Alan S. Gerber and Donald P. Green. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton, 2012.

Mediation

– Reuben M. Baron and David A. Kenny. The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, 51(6):1173–1182, December 1986.

– Kosuke Imai, Luke Keele, Dustin Tingley, and Teppei Yamamoto. Unpacking the Black Box: Learning about Causal Mechanisms from Experimental and Observational Studies. *American Political Science Review*, 105(4):765–789, November 2011.

– John G. Bullock and Shang E. Ha. Mediation Analysis is Harder Than it Looks. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*, chapter 35, pages 508–521. Cambridge University Press, New York, 2011.

Covariates/post-stratification/blocking

– Jake Bowers. Making Effects Manifest in Randomized Experiments. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge*

Handbook of Experimental Political Science, chapter 32. Cambridge University Press, New York, 2011.

– David A. Freedman. On regression adjustments to experimental data. *Advances in Applied Mathematics*, 40:180–193, 2008.

Ethics

– American Political Science Association. APSA Guide to Professional Ethics.

– National Academy of Sciences. On Being a Scientist: Responsible Conduct in Research, 1995.

Human Subjects and Harm-Benefit Tradeoffs

– The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. Technical report, 1978.

– Eleanor Singer and Felice J. Levine. Research Synthesis: Protection of Human Subjects of Research: Recent Developments and Future Prospects for the Social Sciences. *Public Opinion Quarterly*, 67(1):148, 2003.

– Ziva Kunda. The Case for Motivated Reasoning. *Psychological Bulletin*, 108(3):480–498, November 1990.

– Daniel M. Butler and David E. Broockman. Do Politicians Racially Discriminate Against Constituents? A Field Experiment on State Legislators. *American Journal of Political Science*, 55(3):463–477, 2011.

– Philip G. Zimbardo and C Haney. A Pirandellian Prison. *New York Times Magazine*, 1973.

– Allan M. Brandt. Racism and Research: The Case of the Tuskegee Syphilis Study. *The Hastings Center Report*, 8(6):21–29, 1978.

– Nuremberg Code. `http://ohsr.od.nih.gov/guidelines/nuremberg.html`

Deception

– Stanley Milgram. Behavioral Study of Obedience. *Journal of Abnormal Psychology*, 67(4):371–8, October 1963.

– Diana Baumrind. Some Thoughts on Ethics of Research: After Reading Milgram's 'Behavioral Study of Obedience'. *American Psychologist*, pages 421–423, 1964.

– Herbert C. Kelman. Human Use of Human Subjects: The Problem of Deception in Social Psychological Experiments. *Psychological Bulletin*, 67(1):1–11, July 1967.

– Diana Baumrind. Research Using Intentional Deception: Ethical Issues Revisited. *The American Psychologist*, 40(2):165–74, February 1985.

– C.D. Herrera. Ethics, Deception, and 'Those Milgram Experiments'. *Journal of applied philosophy*, 18(3):245–56, January 2001.

Unit Interference

– J. Bowers, M. M. Fredrickson, and C. Panagopoulos. Reasoning about Interference Between Units: A General Framework. *Political Analysis*, 21(1):97–124, December 2013.

–Chapter 8 from Alan S. Gerber and Donald P. Green. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton, 2012.

4.6 Examples: Laboratory Experiments (Mar 11)

What kinds of experiments can be implemented in the laboratory?

– James Habyarimana, Macartan Humphreys, Daniel N. Posner, and Jeremy M. Weinstein. Why Does Ethnic Diversity Undermine Public Goods Provision? *American Political Science Review*, 101(4):709–725, 2007.

– James N. Druckman. Political Preference Formation: Competition, Deliberation, and the (Ir)relevance of Framing Effects. *American Political Science Review*, 98(4):671–686, November 2004.

– Shanto Iyengar, Mark D. Peters, and Donald R. Kinder. Experimental Demonstrations of the 'Not-So-Minimal' Consequences of Television News Programs. *American Political Science Review*, 76(4):848–858, December 1982.

– Elinor Ostrom, James Walker, and Roy Gardner. Covenants with and without a sword: Self-governance is possible. *American Politica*, 86(2):404–417, 1992.

See Also:

– Christopher F. Karpowitz and Tali Mendelberg. An Experimental Approach to Citizen Deliberation. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*, chapter 18. Cambridge University Press, New York, 2011.

– Thomas R. Palfrey. Laboratory Experiments in Political Economy. *Annual Review of Political Science*, 12(1):379–388, June 2009.

– Patrick R. Miller. The Emotional Citizen: Emotion as a Function of Political Sophistication. *Political Psychology*, 32(4):575–600, June 2011.

– Eric Coleman and Elinor Ostrom. Experimental Contributions to Collective Action Theory. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

– Diana C. Mutz. Effects of 'In-Your-Face' Television Discourse on Perceptions of a Legitimate Opposition. *American Political Science Review*, 101(4):621–635, November 2007.

– Rebecca B. Morton and Kenneth C. Williams. *Experimental Political Science and the Study of Causality: From Nature to the Lab*. Cambridge University Press, 2010.

– Shanto Iyengar and Donald R. Kinder. *News That Matters: Television and American Opinion*. The University Of Chicago Press, Chicago, IL, 1987.

4.7 Examples: Field Experiments (Mar 18)

What kinds of experiments can be implemented in the field?

– Alan S. Gerber, Donald P. Green, and Christopher W. Larimer. Social Pressure and Voter Turnout: Evidence from a Large-Scale Field Experiment. *American Political Science Review*, 102(1):33–48, February 2008.

– Rikhil R Bhavnani. Do electoral quotas work after they are withdrawn? evidence from a natural experiment in india. *American Political Science Review*, 103(1):23–35, 2009.

– Leonard Wantchekon. Clientelism and Voting Behavior: Evidence from a Field Experiment in Benin. *World Politics*, 55(3):399–422, June 2011.

– Toby Bolsen, Paul J. Ferraro, and Juan Jose Miranda. Are Voters More Likely to Contribute to Other Public Goods? Evidence from a Large-Scale Randomized Policy Experiment. *American Journal of Political Science*, page In press, 2013.

– Morten Jakobsen and Simon Calmar Andersen. Intensifying social exchange relationships in public organizations: Evidence from a randomized field experiments. *Journal of Policy Analysis and Management*, 32(1):60–82, 2012.

See Also:

– Rachel Milstein Sondheimer. Analyzing the Downstream Effects of Randomized Experiments. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

– Betsy Sinclair. Design and Analysis of Experiments in Multilevel Populations. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

– Kevin Arceneaux. Using cluster randomized field experiments to study voting behavior. *The ANNALS of the American Academy of Political and Social Science*, 601(1):169–179, 2005.

– Alan S. Gerber, James G. Gimpel, Donald P. Green, and Daron R. Shaw. How Large and Long-Lasting Are the Persuasive Effects of Televised Campaign Ads? Results from a Large Scale Randomized Experiment. *American Political Science Review*, 105(1):135–150, March 2011.

– Alan S. Gerber and Donald P. Green. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton, 2012.

– Joanne M. Miller and Jon A. Krosnick. Threat as a Motivator of Political Activism: A Field Experiment. *Political Psychology*, 25(4):507–523, 2004.

4.8 Examples: Survey Experiments (Mar 25)

What kinds of experiments can be implemented in surveys?

Note: One-third of students should present a synopsis today.

– Jens Hainmueller and Michael J. Hiscox. Attitudes toward Highly Skilled and Low-skilled Immigration: Evidence from a Survey Experiment. *American Political Science Review*, 104(1):61–84, March 2010.

– James N. Druckman, Erik Peterson, and Rune Slothuus. How Elite Partisan Polarization Affects Public Opinion Formation. *American Political Science Review*, 107(1):57–79, January 2013.

– Allyson L. Holbrook and Jon A. Krosnick. Social desirability bias in voter turnout reports: Tests using the item count technique. *Public Opinion Quarterly*, 74(1):37–67, 2010.

See Also:

– Paul M. Sniderman. The Logic and Design of the Survey Experiment: An Autobiography of a Methodological Innovation. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*. Cambridge University Press, New York, 2011.

– James H. Kuklinski and Paul J. Quirk. Conceptual Foundations of Citizen Competence. *Political Behavior*, 23(3):285–311, 2001.

– Brian J. Gaines, James H. Kuklinski, and Paul J. Quirk. The Logic of the Survey Experiment Reexamined. *Political Analysis*, 15(1):1–20, October 2007.

– Jason Barabas and Jennifer Jerit. Are Survey Experiments Externally Valid? *American Political Science Review*, 104(02):226–242, May 2010.

– Diana C. Mutz. *Population-Based Survey Experiments*. Princeton University Press, Princeton, NJ, 2011.

– Adam N. Glynn. What Can We Learn with Statistical Truth Serum?: Design and Analysis of the List Experiment. *Public Opinion Quarterly*, 77(S1):159–172, February 2013.

– Howard Schuman and Stan Presser. *Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording, and Context*. SAGE Publications, Thousand Oaks, CA, 1996.

4.9 External Validity (Apr 8)

What do experiments tell us outside of the context of the experiment itself?

Note: One-third of students should present a synopsis today.

–Chapter 3 (only 83–102), Chapter 11, and Chapter 13 from William R. Shadish, Thomas D. Cook, and Donald T. Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton-Mifflin, Boston, MA, 2001.

– Stephen Ansolabehere, Shanto Iyengar, and Adam F. Simon. Replicating Experiments Using Aggregate and Survey Data: The Case of Negative Advertising and Turnout. *American Political Science Review*, 93(4):901–909, 1999.

See Also:

– Lee J. Cronbach. Social Inquiry by and for Earthlings. In *Metatheory in Social Science: Pluralisms and Subjectivities*, pages 83–107. University Of Chicago Press, 1986.

– David O. Sears. College Sophomores in the Laboratory: Influences of a Narrow Data Base on Social Psychology's View of Human Nature. *Journal of Personality and Social Psychology*, 51(3):515–530, 1986.

– James N. Druckman and Cindy D. Kam. Students as Experimental Participants: A Defense of the 'Narrow Data Base'. In James N. Druckman, Donald P. Green, James H. Kuklinski, and Arthur Lupia, editors, *Cambridge Handbook of Experimental Political Science*, chapter 4, pages 41–57. Cambridge University Press, New York, 2011.

– Alan S. Gerber, Donald P. Green, and David W. Nickerson. Testing for Publication Bias in Political Science. *Political Analysis*, 9(4):385–392, 2001.

– Richard R. Lau, Lee Sigelman, and Ivy Brown Rovner. The Effects of Negative Political Campaigns: A Meta-Analytic Reassessment. *The Journal of Politics*, 69(4):1176–1209, November 2007.

4.10 Effect Sizes, Meta-Analysis, Decision Making (Apr 15)

What can do with the results of experiments?

Note: One-third of students should present a synopsis today.

– Larry V. Hedges. Recommendations for Practice: Justifying Claims of Generalizability. *Educational Psychology Review*, 25(3):331–337, August 2013.

– Alan S. Gerber and Neil Malhotra. Publication Bias in Empirical Sociological Research: Do Arbitrary Significance Levels Distort Published Results? *Sociological Methods & Research*, 37(1):3–30, August 2008.

– Joshua K. Swift and Jennifer L. Callahan. The Impact of Client Treatment Preferences on Outcome: A Meta-Analysis. *Journal of Clinical Psychology*, 65(4):368–381, 2009.

– W. Scott Richardson and Allan S. Detsky. What are the results and will they help me in caring for my patients? *Journal of the American Medical Association*, 273(20):1610–1613, May 1995.

See Also:
– John P.A. Ioannidis. Why Most Published Research Findings are False. *PLoS medicine*, 2(8):e124, August 2005.

– Richard R. Lau, Lee Sigelman, and Ivy Brown Rovner. The Effects of Negative Political Campaigns: A Meta-Analytic Reassessment. *The Journal of Politics*, 69(4):1176–1209, November 2007.

– Harris Cooper. *The Handbook of Research Synthesis*. Russell Sage Foundation Publications, 1994.

–Chapter 9 from Alan S. Gerber and Donald P. Green. *Field Experiments: Design, Analysis, and Interpretation*. W.W. Norton, 2012.

– Cochrane Collaboration: `http://www.cochrane.org/`

5 Some supplemental readings on causal inference

Causation

– Gary King, Robert O. Keohane, and Sidney Verba. *Designing Social Inquiry*. Princeton University Press, Princeton, NJ, 1994.

– Henry E. Brady and David Collier. *Rethinking Social Inquiry: Diverse Tools, Shared Standards*. Rowman & Littlefield Publishers, New York, 2010.

– Jasjeet S. Sekhon. Quality Meets Quantity: Case Studies, Conditional Probability, and Counterfactuals. *Perspectives on Politics*, 2(2):281–293, June 2004.

– James Mahoney and Gary Goertz. A Tale of Two Cultures: Contrasting Quantitative and Qualitative Research. *Political Analysis*, 14(3):227–249, June 2006.

Matching

– Jasjeet S. Sekhon. Opiates for the Matches: Matching Methods for Causal Inference. *Annual Review of Political Science*, 12:487–508, 2009.

– Paul R. Rosenbaum and Donald B. Rubin. The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika*, 70(1):41–55, April 1983.

– Donald B. Rubin. *Matched Sampling for Causal Effects*. Cambridge University Press, New York, 2006.

– Stefano M. Iacus, Gary King, and Giuseppe Porro. Causal Inference Without Balance Checking: Coarsened Exact Matching. *Political Analysis*, (617):1–24, August 2009.

– Kevin Arceneaux, Alan S. Gerber, and Donald P. Green. A Cautionary Note on the Use of Matching to Estimate Causal Effects: An Empirical Example Comparing Matching Estimates to an Experimental Benchmark. *Sociological Methods & Research*, 39(2):256–282, August 2010.

– Robert J. LaLonde. Evaluating the Econometric Evaluations of Training Programs with Experimental Data. *American Economic Review*, 76(4):604–620, 1986.

– Daniel E. Ho, Kosuke Imai, Gary King, and Elizabeth A. Stuart. Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference. *Political Analysis*, 15(3):199–236, December 2007.

– Peter M. Steiner, Thomas D. Cook, William R. Shadish, and M.H. Clark. The Importance of Covariate Selection in Controlling for Selection Bias in Observational Studies. *Psychological Methods*, 15(3):250–267, September 2010.

Dose-Response

– Guido W. Imbens. The Role of the Propensity Score in Estimating Dose-Response Functions. *Biometrika*, 87(3):706–710, 2000.

– Kosuke Imai and David A. van Dyk. Causal Inference With General Treatment Regimes. *Journal of the American Statistical Association*, 99(467):854–866, September 2004.

–Section 4.6.3 of Stephen L. Morgan and Christopher Winship. *Counterfactuals and Causal Inference: Methods and Principles for Social Research*. Cambridge University Press, New York, 2007.

Immutable Characteristics

– Christina L. Boyd, Lee Epstein, and Andrew D. Martin. Untangling the Causal Effects of Sex on Judging. *American Journal of Political Science*, 54(2):389–411, April 2010.

– D. James Greiner and Donald B. Rubin. Causal Effects of Perceived Immutable Characteristics. *Review of Economics and Statistics*, Forthcomin, 2011.

Real World Randomization and Approximate Randomization

– Jasjeet S. Sekhon and Rocío Titiunik. When Natural Experiments Are Neither Natural nor Experiments. *American Political Science Review*, 106(1):1–23, February 2012.

– Joshua D. Angrist. Lifetime Earnings and the Vietnam Draft Lottery: Evidence from Social Security Administrative Records. *American Economic Review*, 80(3):313–336, 1990.

– Robert S. Erikson and Laura Stoker. Caught in the Draft: The Effects of Vietnam Draft Lottery Status on Political Attitudes. *American Political Science Review*, 105(2):1–17, May 2011.

– Raghabendra Chattopadhyay and Esther Duflo. Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica*, 72(5):1409–1443, 2004.

– Daniel E. Ho, Kosuke Imai, Gary King, and Elizabeth A. Stuart. Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference. *Political Analysis*, 15(3):199–236, December 2007.

Discontinuities

Time

– Donald T. Campbell and H. Laurence Ross. The Connecticut Crackdown on Speeding: Time-Series Data in Quasi-Experimental Analysis. *Law & Society Review*, 3(1):33–54, 1968.

– Marianne Bertrand, Esther Duflo, and Sendhil Mullainathan. How Much Should We Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics*, 119(1):249–275, 2004.

Geography

– David Card and Alan B. Krueger. Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania. *American Economic Review*, 84(4):772–793, 1994.

– Stefano DellaVigna and Ethan Kaplan. The Fox News Effect: Media Bias and Voting. *Quarterly Journal of Economics*, 122(3):1187–1234, August 2007.

– Gregory A. Huber and Kevin Arceneaux. Identifying the Persuasive Effects of Presidential Advertising. *American Journal of Political Science*, 51(4):957–977, October 2007.

Other

– Joshua D. Angrist and Victor Lavy. Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement. *Quarterly Journal of Economics*, 114(2):533–575,

1999.

– Jens Hainmueller and Holger Lutz Kern. Incumbency as a Source of Spillover Effects in Mixed Electoral Systems: Evidence from a Regression-Discontinuity Design. *Electoral Studies*, 27(2):213–227, June 2008.

– Guido W. Imbens and Thomas Lemieux. Regression Discontinuity Designs: A Guide to Practice. *Journal of Econometrics*, 142(2):615–635, February 2008.

– Howard S. Bloom. Modern Regression Discontinuity Analysis. Unpublished paper, 2009.