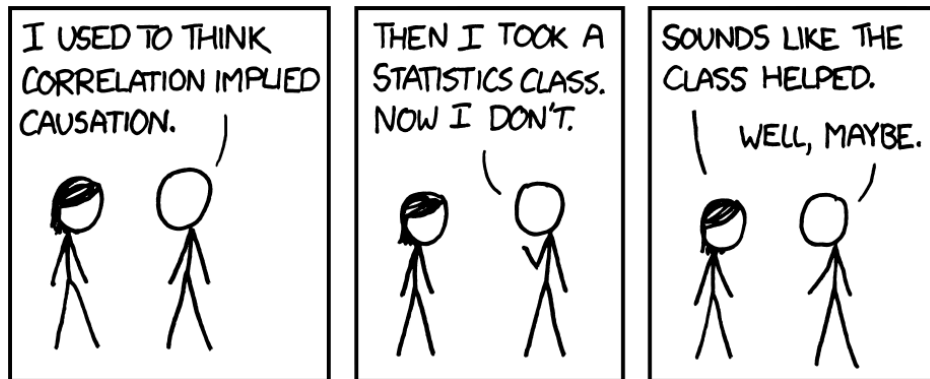


POLS 8500: CAUSAL INFERENCE

Spring 2023

Professor:	Joe Ornstein	Time:	Th 3:55pm – 6:40pm
Email:	jornstein@uga.edu	Place:	101B Baldwin Hall
Website:	github.com/joeornstein/causal-inference		

Correlations alone are rarely satisfying. As social scientists, we don't just want to identify patterns in data – we want to convincingly explain *why* those patterns exist. In this class, we introduce the workhorse methods for inferring causal relationships from observational data, with a focus on building the skills you need to develop convincing research designs, identify useful variation in your data, and write error-free, reproducible code.



Requirements

Your course grade will be based on three components.

- **Readings and Annotations (25%):** Each week, read the assigned chapters/articles and annotate them using [Hypothesis](#).
- **Replications ($2 \times 25\%$):** Choose two of *Optional Bonus Fun* papers on the syllabus below (each student must choose a different set of papers). Using their posted replication materials, recreate the paper's key results in a Quarto report. You will present your findings in a Mock Conference Presentation during the second week of the module.
- **Final Paper (25%):** Write a final paper using one or more of the designs we introduced in class. This could be either an original research project or a re-analysis and extension of one of the papers you replicated.

Course Outline

Here is the rough plan of action for our semester together. Readings abbreviated “NHK” denote our primary textbook, Nick Huntington-Klein’s *The Effect*, available in hard copy or [free online](#).

Week 1: Garbage Cans, Causal Salads, and the Seven Deadly Sins

Required Reading:

- Angrist, Joshua D, and Jörn-Steffen Pischke. 2010. “The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con out of Econometrics.” *Journal of Economic Perspectives* 24(2): 3–30.
- McElreath, Richard. 2021. *Regression, Fire, and Dangerous Things*.
- Schrodtt, Philip A. 2014. “Seven Deadly Sins of Contemporary Quantitative Political Analysis.” *Journal of Peace Research* 51(2): 287–300.

Week 2: The Fundamental Problem of Causal Inference

Required Reading:

- NHK Chapters 1-4

Deeper Dives:

- Abadie, Alberto, Susan Athey, Guido W. Imbens, and Jeffrey M. Wooldridge. 2020. “Sampling-Based versus Design-Based Uncertainty in Regression Analysis.” *Econometrica* 88(1): 265–96.

Weeks 3: D’ya Like DAGs?

Required Reading:

- NHK Chapters 5-8

Deeper Dives:

- Pearl, Judea, and Dana Mackenzie. *The Book of Why: The New Science of Cause and Effect*. Penguin Science. London: Penguin Books, 2019.

Weeks 4–5: Experiments (Natural and Unnatural)

Required Reading:

- NHK Chapters 9-11
- Montgomery, Jacob M., Brendan Nyhan, and Michelle Torres. “How Conditioning on Posttreatment Variables Can Ruin Your Experiment and What to Do about It.” *American Journal of Political Science* 62, no. 3 (2018): 760–75.

Optional Bonus Fun:

- Hall, Andrew B., Connor Huff, and Shiro Kuriwaki. 2019. “Wealth, Slaveownership, and Fighting for the Confederacy: An Empirical Study of the American Civil War.” *American Political Science Review* 113(3): 658–73.

Deeper Dives:

- Sekhon, Jasjeet S., and Rocío Rocio Titiumik. 2012. “When Natural Experiments Are Neither Natural nor Experiments.” *American Political Science Review* 106(1): 35–57.

Weeks 6–7: Selection on Observables (Regression and Matching)

Required Reading:

- NHK Chapter 12-14

Deeper Dives:

- Cinelli, Carlos, and Chad Hazlett. “Making Sense of Sensitivity: Extending Omitted Variable Bias.” *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 82, no. 1 (2020): 39–67. <https://doi.org/10.1111/rssb.12348>.
- Hainmueller, Jens. 2012. “Entropy Balancing for Causal Effects: A Multivariate Reweighting Method to Produce Balanced Samples in Observational Studies.” *Political Analysis* 20(1): 25–46.
- Xu, Yiqing, and Eddie Yang. 2022. “Hierarchically Regularized Entropy Balancing.” *Political Analysis*: 1–8.
- King, Gary, and Richard Nielsen. 2019. “Why Propensity Scores Should Not Be Used for Matching.” *Political Analysis*: 1–20.

Weeks 8–9: Fixed Effects

Required Readings:

- NHK Chapter 16

Deeper Dives:

- Hazlett, Chad, and Leonard Wainstein. “Understanding, Choosing, and Unifying Multilevel and Fixed Effect Approaches.” *Political Analysis* 30, no. 1 (January 2022): 46–65.
- Imai, Kosuke, and In Song Kim. “On the Use of Two-Way Fixed Effects Regression Models for Causal Inference with Panel Data.” *Political Analysis* 29, no. 3 (July 2021): 405–15.

Weeks 10–11: Difference-in-Differences

Required Reading:

- NHK Chapter 18

Deeper Dives:

- Roth, Jonathan, Pedro H. C. Sant’Anna, Alyssa Bilinski, and John Poe. “What’s Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature.” *arXiv*, January 13, 2022. <http://arxiv.org/abs/2201.01194>.
- [Causal Inference w/ Panel Data Lecture Series \(Yiqing Xu\)](#)

Weeks 12–13: Instrumental Variables

Required Reading:

- NHK Chapter 19

Optional Bonus Fun:

- Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2004. “Economic Shocks and Civil Conflict: An Instrumental Variables Approach.” *Journal of Political Economy* 112(4): 725–53.
- Trountine, Jessica. 2015. “Segregation and Inequality in Public Goods.” *American Journal of Political Science* 60(3): 709–25.

Deeper Dives:

- Mellon, Jonathan. 2020. “Rain, Rain, Go Away: 137 Potential Exclusion-Restriction Violations for Studies Using Weather as an Instrumental Variable.” *Working Paper*.
- Lal, Apoorva, Yiqing Xu, Mac Lockhart, and Ziwen Zu. “How Much Should We Trust Instrumental Variable Estimates in Political Science? Practical Advice Based on 57 Replicated Studies.” *Working Paper*.

Week 14-15: Regression Discontinuity

Required Reading:

- NHK Chapter 20

Optional Bonus Fun:

- Klačnja, Marko, and Rocío Titiunik. 2017. “The Incumbency Curse: Weak Parties, Term Limits, and Unfulfilled Accountability.” *The American Political Science Review* 111(1): 129–48.
- Keele, Luke J., and Rocío Titiunik. 2015. “Geographic Boundaries as Regression Discontinuities.” *Political Analysis* 23(1): 127–55.
- Mummolo, Jonathan. 2018. “Modern Police Tactics, Police-Citizen Interactions, and the Prospects for Reform.” *The Journal of Politics* 80(1): 1–15.

Deeper Dives:

- Cattaneo, Matias D, Nicolas Idrobo, and Rocío Titiunik. 2018. “A Practical Introduction to Regression Discontinuity Designs: Volume I.”
- Marshall, John. 2022. “Can Close Election Regression Discontinuity Designs Identify Effects of Winning Politician Characteristics?” *American Journal of Political Science*.
- Ornstein, Joseph T. & Duck-Mayr, JBrandon. 2022. “Gaussian Process Regression Discontinuity”. *Working Paper*.

Academic Honesty

Remember that when you joined the University of Georgia community, you agreed to abide by a code of conduct outlined in the academic honesty policy called *A Culture of Honesty*. It has some pretty specific things to say on the subject of cheating. Quite specific. I will report any and all dishonest conduct to the Office of the Vice President for Instruction.

Mental Health and Wellness Resources

- If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit <https://sco.uga.edu>. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.
- UGA has several resources for a student seeking [mental health services](#) or [crisis support](#).
- If you need help managing stress anxiety, relationships, etc., please visit [BeWellUGA](#) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.
- Additional resources can be accessed through the UGA App.