

GOV 6344: Natural Experiments

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This course provides an overview of design-based inference and experimental methods, with a focus on historical political economy. Each week presents the foundations of new method, along with innovative applications. Students will leave the course with a better understanding of methodologies such as regression discontinuity design, instrumental variables, differences-in-differences, and quasi versus natural experiments; as well as applications using plausibly exogenous geographic, climatic, or economic shocks, and potentially endogenous historical institutions.

REQUIRED READINGS

Articles will be posted on the course website. The required textbooks for this class are as follows (and many are available online):

1. Angrist, Joshua D., and Jörn-Steffen Pischke. *Mastering Metrics: The Path from Cause to Effect*. Princeton, NJ: Princeton University Press, 2014.
2. Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge: Cambridge University Press.
3. Scott Cunningham's MixTape: <https://mixtape.scunning.com>
4. Huntington-Klein, Nick. (2021, forthcoming), *The Effect*. <https://theeffectbook.net/index.html>

GRADING

Grading will consist of short assignments or problem sets, a data exercise, and a research design for an original project submitted at the end of the course. The proposal should demonstrate knowledge of the methods and critical thinking learned in class. Further, students should use this opportunity to develop and get feedback on a project they might want to pursue in the future.

10%	Referee Reports	September 8, December 1
40%	Problem Sets	Assorted
20%	Data Exercise	October 6
30%	Final Research Design	December 20

All assignments are due by **11:59 pm** on the assigned due date, submitted to Canvas.

Please note that late assignments will be marked down a third of a grade (such as from A to A-) for each day following the due date.

If a student wishes to contest grades on any assignment, they must provide a one-page written statement within a week of the assignment being returned. Writing such a statement does not guarantee any changes in grades.

The course follows the general principles established in the Cornell Code of Academic Integrity; see <https://cuinfo.cornell.edu/aic.cfm>. Cheating, plagiarism, and other offenses outlined in the code will not be permitted and will result in a failing grade.

Schedule

	Topic	Assignments
W	Observational Data	
W	Causal Inference and DAGs	Referee Report Due
W	Natural Experiments	
W	Knowing Your Data and Cases	PSET I Due
W	DID I: Introduction	Data Exercise Due
W	DID II: TWFE Models	
W	RDD I: Introduction	PSET 2 Due
W	RDD II: Geographic and Population RDD	
W	Research Design and PAPs	
W	Instrumental Variables I: Introduction	PSET 3 Due
W	Instrumental Variables II: Historical Persistence	
W	Promises and Pitfalls	Referee Report II Due
TBD		Final RD Due

READINGS

Observational Data

[If you need a stats review, please skim Chapter 13, "Regression," in Nick Huntington-Klein's book: <https://theeffectbook.net/ch-StatisticalAdjustment.html>]

Samii, C. (2016). "Causal empiricism in quantitative research." *The Journal of Politics* 78(3), 941-955. <https://doi.org/10.1086/686690>

Lundberg, I., Johnson, R., & Stewart, B. M. (2021). "What Is Your Estimand? Defining the Target Quantity Connects Statistical Evidence to Theory." *American Sociological Review*, 86(3), 532-565. <https://doi.org/10.1177/00031224211004187>

Clarke, Kevin A. (2005). "The Phantom Menace: Omitted Variable Bias in Econometric Research." *Conflict Management and Peace Science* 22, no. 4: 341-52. <https://doi.org/10.1080/07388940500339183>.

Other Resources:

- Lenz, G., & Sahn, A. (2021). "Achieving Statistical Significance with Control Variables and Without Transparency." *Political Analysis*, 29(3), 356-369. doi:10.1017/pan.2020.31
- "P-hacking Fast and Slow", <http://datacolada.org/91>
- Middleton, J., Scott, M., Diakow, R., & Hill, J. (2016). Bias Amplification and Bias Unmasking. *Political Analysis*, 24(3), 307-323. doi:10.1093/pan/mpw015

Causal Inference

Mastering Metrics, Chapter 1

Mixtape, Directed Acyclical Graphs and Potential Outcomes Framework chapters (67-103)

Keele, L., Stevenson, R., & Elwert, F. (2020). "The causal interpretation of estimated associations in regression models." *Political Science Research and Methods*, 8(1), 1-13. doi:10.1017/psrm.2019.31

Pearl, J. And Mackenzie, D. (2018). *The Book of Why: The New Science of Cause and Effect*. New York: Basic Books. Chapters 1-2. See <http://bayes.cs.ucla.edu/WHY/>

Other Resources:

- Eggers, Tuñón, Dafoe. "Placebo Tests for Causal Inference," Working Paper 2021. https://pelg.ucsd.edu/Eggers_2021.pdf
- Lewbel, Arthur. (2019). "The Identification Zoo: Meanings of Identification in Econometrics." *Journal of Economic Literature*, 57 (4): 835-903.
- Eric B. Schneider. (2020). "Collider bias in economic history research." *Explorations in Economic History*, Volume 78, <https://doi.org/10.1016/j.eeh.2020.101356>.
- Imbens, G. Potential Outcome and Directed Acyclic Graph Approaches to Causality: Relevance for Empirical Practice in Economics. Working Paper, 2020. <https://arxiv.org/pdf/1907.07271.pdf>

Natural Experiments

Dunning, pages 1-61

Titunik, Rocio. (2021). "Natural Experiments," chapter in *Advances in Experimental Political Science*, edited by James Druckman and Donald Green. <https://arxiv.org/pdf/2002.00202.pdf>

Robinson, James A, and Jared Diamond. (2010). *Natural Experiments of History*. Cambridge, MA: Harvard University Press. Chapter 7, "From Ancien Régime to Capitalism: The Spread of the French Revolution as a Natural Experiment."

Other Resources:

- Titunik, Rocio, and Jasjeet Sekhon. (2012). "When Natural Experiments Are Neither Natural Nor Experiments." *American Political Science Review* 106 (1): 35-57.
- Skim Coleman, Thomas, Causality in the Time of Cholera: John Snow As a Prototype for Causal Inference (March 13, 2019). Available at SSRN: <https://ssrn.com/abstract=3262234> or <http://dx.doi.org/10.2139/ssrn.3262234>
- Hainmueller, J., & Hangartner, D. (2013). Who Gets a Swiss Passport? A Natural Experiment in Immigrant Discrimination. *American Political Science Review*, 107(1), 159-187. doi:10.1017/S0003055412000494
- Bhavnani, Rikhil R. (2009). "Do Electoral Quotas Work after They Are Withdrawn? Evidence from a Natural Experiment in India." *American Political Science Review* 103: 23-35.
- Green, Donald P., Tiffany C. Davenport, and Kolby Hanson. (2019). "Are There Long-Term Effects of the Vietnam Draft on Political Attitudes or Behavior? Apparently Not." *Journal of Experimental Political Science* 6(2): 71-80.
- Cirone, A and Van Coppenolle, B. (2018). "Cabinets, Committees, and Careers: The Causal Effect of Committee Service." *Journal of Politics*, Volume 80, Number 3.

Knowing Your Data and Cases

Cirone, Alexandra and Spirling, Arthur. (2021), "Turning History into Data: Data Collection, Measurement, and Inference in HPE", *Journal of Historical Political Economy*: Vol. 1: No. 1, pp 127-154. <http://dx.doi.org/10.1561/115.00000005>

The Effect, Chapters 1-4

Other Resources:

- King, Gary and Keohane, Robert O. and Verba, Sidney. (1994). *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press.
- Geddes, Barbara. (2003). *Paradigms and Sand Castles: Theory Building and Research Design in Comparative Politics*. University of Michigan Press: Ann Arbor
- Gordon and Simpson. (2020). "Causes, Theories, and the Past in Political Science." *Public Choice*, 185, 315-333.
- Bateman, D. A. and Teele, D. L. (2019), 'A Developmental Approach to Historical Causal Inference', *Public Choice*, 185.

DiD I

The Effect, Chapter 18

Mastering Metrics, Chapter 5

Malesky, Edmund, Nguyen Cuongviet, Tran Anh. (2014). "The Impact of Recentralization on Public Services: A Difference-in-Differences Analysis of the Abolition of Elected Councils in Vietnam." *American Political Science Review*;108(1):144-168. doi:10.1017/S0003055413000580

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

Other Resources:

- Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. (2004). "How Much Should We Trust Differences- In-Differences Estimates?" *QJE*, 119.1.
- Glynn, A.N. and Kashin, K. (2017), Front-Door Difference-in-Differences Estimators. *American Journal of Political Science*, 61: 989-1002. <https://doi-org.proxy.library.cornell.edu/10.1111/ajps.12311>
- Ladd, J.M.D., and G.S. Lenz. (2009). "Exploiting a rare communication shift to document the persuasive power of the news media." *American Journal of Political Science* 53(2).
- Abraham, Sarah, and Liyang Sun. 2018. "Estimating Dynamic Treatment Effects in Event Studies with Heterogeneous Treatment Effects." Working Paper.
- Baker, Andrew. 2019. "Difference-in-Differences Methodology." <https://andrewcbaker.netlify.com/2019/09/25/difference-in-differences-methodology/>.

DiD II

Andrew Goodman-Bacon. (2021). "Difference-in-differences with variation in treatment timing," *Journal of Econometrics*, <https://doi.org/10.1016/j.jeconom.2021.03.014>.

Brantly Callaway, Pedro H.C. Sant'Anna, Difference-in-Differences with multiple time periods, *Journal of Econometrics*, Volume 225, Issue 2, 2021, <https://doi.org/10.1016/j.jeconom.2020.12.001>

Jakiela, Pamela. (2021). Simple Diagnostics for Two-Way Fixed Effects. <https://arxiv.org/abs/2103.13229>

Imai, K., & Kim, I. (2021). "On the Use of Two-Way Fixed Effects Regression Models for Causal Inference with Panel Data. *Political Analysis*, 29(3), 405-415. doi:10.1017/pan.2020.33

Other Resources:

- Wooldridge, Jeffrey. (2021). Two-Way Fixed Effects, the Two-Way Mundlak Regression, and Difference-in-Differences Estimators. https://www.researchgate.net/publication/353938385_Two-Way_Fixed_Effects_the_Two-Way_Mundlak_Regression_and_Difference-in-Differences_Estimators
- <https://www.andrewheiss.com/blog/2021/08/25/twfe-diagnostics/>

RDD I

Dunning, Chapter 4

Mastering Metrics, Chapter 6

[A Practical Introduction to Regression Discontinuity Designs: Foundations](#), with Matias D. Cattaneo and Nicolas Idrobo. *Elements in Quantitative and Computational Methods for the Social Sciences*. Cambridge University Press, 2020.

Other Resources:

- Calonico, Sebastian, Cattaneo, Matias D., Farrell, Max H., Titiunik, Rocío. (2019). Regression Discontinuity Designs Using Covariates, *Review of Economics and Statistics* 101 (3): 442-451.
- Kolesár, Michal and Christoph Rothe. (2018). "Inference in Regression Discontinuity Designs with a Discrete Running Variable". *American Economic Review* 108.8.
- Eggers, Andy and Ronny Freier, Tommaso Nannicini, and Veronica Grembi. "Regression Discontinuity Designs Based on Population Thresholds: Pitfalls and Solutions." *American Journal of Political Science*.
- de la Cuesta, Brandon and Kosuke Imai. (2016). "Misunderstandings About the Regression Discontinuity Design in the Study of Close Elections." *Annual Review of Political Science*, 19:375-96
- Eggers A, Fowler A, Hainmueller J, Hall A, Snyder J. (2015). "On the validity of the regression discontinuity design for estimating electoral effects: new evidence from over 40,000 close races." *American Journal of Political Science*, 59(1):259-74
- De Kadt, D. (2017). "Voting Then, Voting Now: The Long Term Consequences of Participation in South Africa's first democratic election." *The Journal of Politics*, Volume 79, Number 2.

RDD II

Hausman, C and Rapson. D.S. (2018). "Regression Discontinuity in Time: Considerations for Empirical Applications." *Annual Review of Resource Economics*, 10:1, 533-552.

Keele, Luke and Rocío Titiunik. (2014). "Geographic Boundaries as Regression Discontinuities." *Political Analysis*, 23(1): 127-55.

Keele, L., & Titiunik, R. (2016). Natural Experiments Based on Geography. *Political Science Research and Methods*, 4(1), 65-95. doi:10.1017/psrm.2015.4

Other Resources:

- Dell M, Lane N, Querubin P. The Historical State, Local Collective Action, and Economic Development in Vietnam. Working Paper, <https://scholar.harvard.edu/files/dell/files/170101master.pdf>
- Thomas Fujiwara, T.; Laudaes, H. Valencia Caicedo, F. "Tordesillas, Slavery and the Origins of Brazilian Inequality." Working Paper 2021. https://cepr.org/sites/default/files/Slavery_CEPR.pdf

Pre-Analysis Plans and Research Designs

Gustafsson, Karl, and Linus Hagström. (2018). "What is the point? Teaching graduate students how to construct political science research puzzles." *European Political Science* 17, no. 4: 634-648

Monogan, J. (2015). "Research Preregistration in Political Science: The Case, Counterarguments, and a Response to Critiques." *PS: Political Science & Politics*, 48(3), 425-429. doi:10.1017/S1049096515000189

Duflo, et al (2020). "In Praise of Moderation: Suggestions for the Scope and Use of Pre-Analysis Plan for RCTs in Economics", NBER Working Paper Working Paper 26993.

Cirone, (2021). "Elementary, my dear PAP?" <https://broadstreet.blog/2021/01/20/elementary-my-dear-pap/>

Other Resources:

- Lupia, Arthur, and Colin Elman. 2014. "Openness in Political Science: Data Access and Research Transparency: Introduction." *PS: Political Science & Politics* 47: 19-42
- Ofosu, G., & Posner, D. (2021). Pre-Analysis Plans: An Early Stocktaking. *Perspectives on Politics*, 1-17. doi:10.1017/S1537592721000931
- Ganimian, Alejandro. Example of Pre-Analysis Plan Template: <https://www.bitss.org/wp-content/uploads/2015/12/Pre-Analysis-Plan-Template.pdf>
- Coffman, Lucas C., and Muriel Niederle. 2015. "Pre-analysis Plans Have Limited Upside, Especially Where Replications Are Feasible." *Journal of Economic Perspectives*, 29 (3): 81-98.
- <https://declaredesign.org>
- <https://www.povertyactionlab.org/resource/pre-analysis-plans>

Instrumental Variables I

Dunning, Chapter 4

Mastering Metrics, Chapter 3

Sovey, Allison and Donald P. Green. (2011). Instrumental Variables Estimation in Political Science: A Readers' Guide. *American Journal of Political Science*, 55:1

Other Resources:

- Aronow, Peter M. and Allison Carnegie. (2013). "Beyond LATE: Estimation of the Average Treatment Effect with an Instrumental Variable." *Political Analysis* 21(4):492-506. <https://doi.org/10.1093/pan/mpt013>
- Mellon, Jonathan, Rain, Rain, Go Away: 176 Potential Exclusion-Restriction Violations for Studies Using Weather as an Instrumental Variable (July 1, 2021). Available at SSRN: <https://ssrn.com/abstract=3715610> or <http://dx.doi.org/10.2139/ssrn.3715610>
- Mogstad, M; Torgovitsky, A; Walters, C. (2019). The Causal Interpretation of Two-Stage Least Squares with Multiple Instrumental Variables. NBER Working Paper 25691, <http://www.nber.org/papers/w25691>
- Miguel, Edward, Shanker Satyanath, and Ernest Sergenti. 2004. "Economic shocks and civil conflict: An instrumental variables approach." *Journal of Political Economy*, 122.
- Wang Yu and Bellemare, Marc. "Lagged Variable as Instruments," Working Paper 2019. See <https://marcfbellemare.com/wordpress/13422>.
- Kern HL, Hainmueller J. Opium for the Masses: How Foreign Media Can Stabilize Authoritarian Regimes. *Political Analysis*. 2017;17(4):377-399. doi:10.1093/pan/mpp017

Instrumental Variables II (Historical Persistence)

Angrist, Joshua and Alan B. Krueger. (2001). "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." *Journal of Economic Perspectives*, Volume 15, Number 4.

Cirone and Pepinsky (2021). Historical Persistence. *Annual Review of Political Science*, forthcoming.

Hans-Joachim Voth,(2021). "Persistence - myth and mystery," chapter in *The Handbook of Historical Economics*, ed. Alberto Bisin and Giovanni Federico. Academic Press, Pages 243-267.

Avidit Acharya, Matthew Blackwell, and Maya Sen. (2016). "The Political Legacy of American Slavery." *Journal of Politics* 78 (3): 621-641

Other Resources:

- Kelly, Morgan, The Standard Errors of Persistence (June 3, 2019). Available at SSRN: <https://ssrn.com/abstract=3398303> or <http://dx.doi.org/10.2139/ssrn.3398303>
- Casey, Gregory P. and Klemp, Marc, Instrumental Variables in the Long Run (August 8, 2017). Available at SSRN: <https://ssrn.com/abstract=3025286> or <http://dx.doi.org/10.2139/ssrn.3025286>
- Nunn N. "Shackled to the Past: The Causes and Consequences of Africa's Slave Trade." Chapter 5 in Diamond and Robinson.
- Dippel, Christian, and Bryan Leonard. "Not-so-Natural Experiments in History." *Journal of Historical Political Economy* 1(1) (2021): 1-30.
- Abad, Leticia Arroyo, and Noel Maurer. "History Never Really Says Goodbye: A Critical Review of the Persistence Literature." *Journal of Historical Political Economy* 1(1) (2021): 31-68.

Promises and Pitfalls

Ferwerda, Jeremy and Nicholas L. Miller. 2014. "Political Devolution and Resistance to Foreign Rule: A Natural Experiment." *American Political Science Review*, 108(3)

Kocher, Matthew A. and Nuno P. Monteiro. 2016. "Lines of Demarcation: Causation, Design-Based Inference, and Historical Research." *Perspectives on Politics*, 14:4.

Ferwerda, Jeremy and Miller, Nicholas, Rail Lines and Demarcation Lines: A Response (July 8, 2015). Available at SSRN: <https://ssrn.com/abstract=2628508> or <http://dx.doi.org/10.2139/ssrn.2628508>

Brodeur, Abel, Nikolai Cook, and Anthony Heyes. 2020. "Methods Matter: p-Hacking and Publication Bias in Causal Analysis in Economics." *American Economic Review*, 110 (11): 3634-60.