

Causal Inference for the Social Sciences

Reading list

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For every topic (two each week), we are going to read relevant literature from across the several disciplines (mostly Sociology, Economics, Political Science, Epidemiology, Statistics, and Computer Sciences). Causal inference is an interdisciplinary endeavor, so no single discipline covers all fronts. It may well be the case that the answer to your question has been found somewhere else; but you're not going to find it if you only search inside your disciplinary journals. Also, different disciplines have slightly different ways of explaining and justifying things, and you may find some of them more helpful and illuminating than others. Eventually, I hope you will develop the skill to read across niches and fill in the gaps when background knowledge is taken for granted.

When available, I have included reference textbooks that provide a canonical explanation of the concepts and methods we are covering. To keep up with recent developments, we are also going to read one contemporary review paper every week¹. But, since the idea is to obtain a panorama, not only of the state-of-the-art, but also of the genealogy of the ideas we are discussing in this class and the controversies surrounding them, I have included at least one foundational text each week. This has also a pedagogical use. It is not infrequent for concepts to be presented in a rather transparent and intuitive way at the beginning, only to get obfuscated along the way (but also the other way around!).

The remaining weekly readings will include at least one applied article (to see different empirical strategies in action, to have a template of what credible causal inference may look like, and to provide our class discussions with a common ground), one relatively straightforward methodological piece, and a second, more challenging one. It is fine if you don't get everything in the first pass (in fact, it is expected). It is also fine if you need to pause, read again, find a Youtube video explaining the math (especially if it is from [3Blue1Brown](#)), bring some paper and a pen, and work through some details yourself.

I have marked with an (*) (:sparkles:) the texts I expect you to read first, which should help you with the rest of the readings. The references marked as (**) should ideally be read before the weekly lecture.

¹I have also collected some slides or video presentations that are particularly good at explaining a new method or reviewing recent advances.

1 Week 1

1.1 Why causal inference?

Keywords: theoretical estimand, empirical estimand, estimator, estimate, assumptions

Greenland, Sander. 2022. “The Causal Foundations of Applied Probability and Statistics.” Pp. 605–24 in *Probabilistic and Causal Inference: The Works of Judea Pearl*. Vol. 36. New York, NY, USA: Association for Computing Machinery.

Hernán, Miguel A., John Hsu, and Brian Healy. 2019. “A Second Chance to Get Causal Inference Right: A Classification of Data Science Tasks.” *CHANCE* 32(1):42–49. doi: 10.1080/09332480.2019.1579578.

Holland, Paul W. 1986. “Statistics and Causal Inference.” *Journal of the American Statistical Association* 81(396):945–60. doi: 10.2307/2289064.

Imbens, Guido W. 2022. “Causality in Econometrics: Choice vs Chance.” *Econometrica* 90(6):2541–66. doi: 10.3982/ECTA21204.

Lundberg, Ian, Rebecca Johnson, and Brandon M. Stewart. 2021. “What Is Your Estimand? Defining the Target Quantity Connects Statistical Evidence to Theory.” *American Sociological Review* 86(3):532–65. doi: 10.1177/00031224211004187.

Mitra, Nandita, Jason Roy, and Dylan Small. 2022. “The Future of Causal Inference.” *American Journal of Epidemiology* 191(10):1671–76. doi: 10.1093/aje/kwac108.

Ogburn, Elizabeth L., and Ilya Shpitser. 2021. “Causal Modelling: The Two Cultures.” *Observational Studies* 7(1):179–83.

Pearl, Judea, and Dana Mackenzie. 2019. *The Book of Why: The New Science of Cause and Effect*. 1st edition. London: Penguin.

1.2 Potential outcomes to hypothesize, Experiments to learn

Keywords: potential outcomes, switching equation, treatment effect, SUTVA, consistency, exchangeability, ignorability, independence, identification, randomization, balance, clusters, blocks

Deaton, Angus, and Nancy Cartwright. 2018. “Understanding and Misunderstanding Randomized Controlled Trials.” *Social Science & Medicine* 210:2–21. doi: 10.1016/j.socscimed.2017.12.005.

Druckman, James N. 2022. *Experimental Thinking: A Primer on Social Science Experiments*. Cambridge: Cambridge University Press.

Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments – Design, Analysis, and Interpretation*. Illustrated edition. New York London: W. W. Norton & Company.

Glennerster, Rachel, and Kudzai Takavarasha. 2013. *Running Randomized Evaluations: A Practical Guide*. Illustrated edition. Princeton, NJ: Princeton University Press.

Kohavi, Ron. 2020. *Trustworthy Online Controlled Experiments: A Practical Guide to A/B Testing*. 1st edition. Cambridge: Cambridge University Press.

Rubin, Donald B. 2008. "For Objective Causal Inference, Design Trumps Analysis." *The Annals of Applied Statistics* 2(3):808–40. doi: 10.1214/08-AOAS187.

Senn, Stephen. 2013. "Seven Myths of Randomisation in Clinical Trials." *Statistics in Medicine* 32(9):1439–50. doi: 10.1002/sim.5713.

Veltri, Giuseppe. 2023. *Designing Online Experiments for the Social Sciences*. 1st edition. Los Angeles London New Delhi Singapore Washington DC Melbourne: SAGE Publications Ltd.