

Summer Term 2024**Research Design and Research Logic****Instructor:** Leonce Röth*Time:* Monday 10:00-11:30*Place:* Seminarraum S145, Building 216*First Session:* 08.04.2024**Office hours:** leonce.roeth@uni-koeln.de

On demand by appointment.

Registration

Registration for exam in KLIPS2.

Course description

In this course, you will learn how to systemize your causal thinking and reasoning and learn about different research designs for answering causal research questions. In the first part, we will discuss what it means to infer causation and what it is that makes one factor causal and another one not.

In part two, you will make first steps to systemize your causal and theoretical thinking using directed acyclic graphs (DAGs) as a modern, informal tool of causal mapping. Simple. More generally, DAGs can give one an idea about what causal research questions can be answered in principle and how.

In the third part, we will discuss different research designs (a map or plan for answering a research question). We will structure and compare the designs across common dimensions – few cases vs many cases; experimental vs observational; qualitative vs quantitative – and carve out their unique strengths and weaknesses for answering research questions.

In the fourth part, we develop a meta-view on research designs. Based on replications and systematic reviews, we discuss how credible different research design are in practice and how much trust we can put on evidence based on different designs.

At the end of the course, you will be familiar with (1) the basic elements of causality-oriented empirical research; (2) different understandings of causation; (3) how to theorize causal models, use DAGs to visualize them and understand what they imply for your analysis; (4) a variety of research designs and the research questions one can (and cannot) answer with them; (5) an overview of the credibility of designs.

Reading note: You do not have to read everything. A guide to the literature will be provided in the first session!

Part I: Foundations

08.04.2024: Foundations

Varieties of research and what a research design is

Halperin, Sandra and Oliver Heath (2012): *Political Research: Methods and Practical Skills*. Oxford, New York: Oxford University Press: Chapter 2.

- The chapter gives an overview of different ways of doing political research. We zoom in on research aiming at making causal inferences for the rest of the course, but it is important to know there is more to political research.

King, Gary, Robert O. Keohane and Sidney Verba (1994): *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton: Princeton University Press: Chapter 1.

- Summarizes some elements of good research design.

Research goals

- A general overview of research questions and the main research goals that inform questions.

Halperin, Sandra and Oliver Heath (2012): *Political Research: Methods and Practical Skills*. Oxford, New York: Oxford University Press: Chapter 4.

- A slightly different taxonomy of research goals

Toshkov, Dimitar (2016): *Research Design in Political Science*. Palgrave: 23-44.

Research questions and how to motivate them

- A general overview of research questions and how to find a good research question.

Halperin, Sandra and Oliver Heath (2012): *Political Research: Methods and Practical Skills*. Oxford, New York: Oxford University Press: Chapter 4.

Day, Christopher and Kendra L. Koivu (2018): *Finding the Question: A Puzzle-Based Approach to the Logic of Discovery*. *Journal of Political Science Education* 15 (3): 377-386.

- Focuses on puzzles as one specific way of formulating questions that is probably the most popular one in political science. We will see whether puzzles deserve this popularity or not

15.04.2024: Summarizing existing ideas and evidence

Baglione, L. A. (2018). *Writing a research paper in political science: A practical guide to inquiry, structure, and methods*. Cq Press. Chapter 4: Making sense of scholarly answers to your reserach question: Writing the literature review.

- Empirical example:
- We take multiple examples from the literature here.

First Assignment (Deadline 29.04):

- **Research Question**
- **Literature Review**

Part II: Causation, causal inference and causal models

22.04.2024: This thing called “causation” and how to identify it when it is there

Rohlfing, Ingo and Christina Isabel Zuber (2021): Check Your Truth Conditions! Clarifying the Relationship between Theories of Causation and Social Science Methods for Causal Inference. *Sociological Methods & Research* 50 (4): 1623-1659.

- This paper gives an overview over different perspectives on causation and causal inference that have been developed over the decades (or even centuries, when we go back to Hume in the 18th century)

Huntington-Klein, Nick (2021): *The Effect: An Introduction to Research Design and Causality*. Boca Raton: Chapman and Hall/CRC: chapter 5 (<https://theeffectbook.net/chIdentification.html>).

- The book has been published, but the author has put all chapters online. Hence, I include the URLs here. This chapters introduces the idea of ‘identification’ that is central for the following sessions.

Humphreys M, Jacobs AM. (2023). *Integrated Inferences: Causal Models for Qualitative and Mixed-Method Research*. Cambridge University Press; 2023. Chapter 2: Causal Models. (<https://www.cambridge.org/core/books/integrated-inferences/causal-models/7065E9FB1DB49C51A1C7CF104FE7D8C6>)

- The book has been published, but the author has put all chapters online. Hence, I include the URLs here. This chapters introduces the idea of ‘identification’ similar to Huntington-Klein but slightly more formal.

29.04.2024: Illustrating causal models

Huntington-Klein, Nick (2021): *The Effect: An Introduction to Research Design and Causality*. Boca Raton: Chapman and Hall/CRC: chapters 6 (<https://theeffectbook.net/chCausalDiagrams.html>), 7 (<https://theeffectbook.net/ch-DrawingCausalDiagrams.html>).

- A relatively intuitive way to visualize causal models, aka as directed acyclic graphs (DAGs).

Humphreys M, Jacobs AM. (2023). *Integrated Inferences: Causal Models for Qualitative and Mixed-Method Research*. Cambridge University Press; 2023. Chapter 3: Illustrating Causal Models. (<https://www.cambridge.org/core/books/integrated-inferences/illustrating-causal-models/66DDFDB357069701A88E12C9DF434CED>)

- The book has been published, but the author has put all chapters online. Hence, I include the URLs here. This chapters introduces the idea of Illustrating causal model via DAGs.

06.05.2024: Causal Identification - Keep that backdoor shut

Huntington-Klein, Nick (2021): *The Effect: An Introduction to Research Design and Causality*. Boca Raton: Chapman and Hall/CRC: chapter 8. (<https://theeffectbook.net/chCausalPaths.html>)

- Once we have covered the basics of causal models, we discuss how one can use them to think about whether and how one can learn something about the causal effect of a variable. The backdoor criterion is one of the strategies to identify whether a variable is causal.
- Empirical example:

Mutz, Diana C. (2016): Harry Potter and the Deathly Donald. *PS: Political Science & Politics* 49 (4): 722-729.

- We use this text, which does not include a causal diagram, to construct one ourselves to see how sound the quantitative analysis is (one does not need to anything about regression for this).

Second Assignment (Deadline 03.06):

- Application DAG

Part III: Causal identification without models - Design based approaches

13.05.2024: Basics of (quantitative) designs

Keele, Luke (2015): The Statistics of Causal Inference: A View from Political Methodology. *Political Analysis* 23 (3): 313-335.

Cunningham, Scott (2021) '2.Probability and Regression Review', in: *Causal Inference. The Mixtape*, New Haven: Yale University Press. https://mixtape.scunning.com/02-probability_and_regression

- Introduces the distinction between design-based inference and model-based inference and different ways to make both types of inferences.

Angrist, Joshua D. and Jörn-Steffen Pischke (2009): *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton: Princeton University Press: Chapter 2.

- This chapter is focused on quantitative research and designs. This is useful, but we will broaden the perspective and apply the general idea behind their approach to quantitative and qualitative methods.

27.05.2024: Natural experiments

Dunning, Thad (2008): *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge: Cambridge University Press: Chapter 2.

- Empirical illustrations:

Silva, Bruno Castanho and Sven-Oliver Proksch (2020): Fake It 'Til You Make It: A Natural Experiment to Identify European Politicians' Benefit from Twitter Bots. *American Political Science Review*: 1-7.

Erikson, R. S., & Stoker, L. (2011). Caught in the draft: The effects of Vietnam draft lottery status on political attitudes. *American Political Science Review*, 105(2), 221-237.

Hyde, S. D. (2007). The observer effect in international politics: Evidence from a natural experiment. *World politics*, 60(1), 37-63.

03.06.2024: Regression-discontinuity designs

Dunning, Thad (2008): *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge: Cambridge University Press: Chapter 3.

Smith, Leah M., Linda E. Lévesque, Jay S. Kaufman and Erin C. Strumpf (2017): Strategies for evaluating the assumptions of the regression discontinuity design: A case study using a human papillomavirus vaccination programme. *International Journal of Epidemiology* 46 (3): 939-949.

- Empirical illustrations:

Eggers, A. C., & Hainmueller, J. (2009). MPs for sale? Returns to office in postwar British politics. *American Political Science Review*, 103(4), 513-533.

Angrist, J. D., Battistin, E., & Vuri, D. (2017). In a small moment: Class size and moral hazard in the Italian Mezzogiorno. *American Economic Journal: Applied Economics*, 9(4), 216-249.

10.06.2024: Synthetic controls

Cunningham, Scott (2021) '10. Synthetic Control', in: Causal Inference. The Mixtape, New Haven: Yale University Press. https://mixtape.scunning.com/10-synthetic_control
 Abadie, Alberto, Alexis Diamond und Jens Hainmueller (2015) 'Comparative Politics and the Synthetic Control Method', *American Journal of Political Science* 59(2), pp. 495-510.

Doudchenko, N., & Imbens, G. W. (2016). *Balancing, regression, difference-in-differences and synthetic control methods: A synthesis* (No. w22791). National Bureau of Economic Research.

- Empirical illustrations:

Funke, M., Schularick, M., & Trebesch, C. (2023). Populist leaders and the economy. *American Economic Review*, 113(12), 3249-3288.

17.06.2024: Differences-in-differences

Cunningham, Scott (2021) '9. Differences-in-Differences', in: Causal Inference. The Mixtape, New Haven: Yale University Press. https://mixtape.scunning.com/09-difference_in_differences

Angrist, Joshua D. und Jörn-Steffen Pischke (2015) '5. Differences-in-Differences', in: Mastering Metrics. The Path from Cause to Effect, Princeton: Princeton University Press, pp. 178-208.

Hassell, H. J., & Holbein, J. B. (2023). Navigating potential pitfalls in difference-in-differences designs: reconciling conflicting findings on mass shootings' effect on electoral outcomes. *American Political Science Review*

- Empirical illustration:

Garcia-Montoya, Laura , Ana Arjona, and Matthew Lacombe (2022). Violence and voting in the united states: How school shootings affect elections. *American Political Science Review* 116(3), 807–826.

Hassell, Hans JG , John B Holbein, and Matthew Baldwin (2020). Mobilize for our lives? school shootings and democratic accountability in us elections. *American Political Science Review* 114(4), 1375–1385.

01.07.2024 How much should we trust the design-based approach?

Brodeur, A., Esterling, K., Ankel-Peters, J., Bueno, N. S., Desposato, S., Dreber, A., ... & Young, L. (2024). Promoting Reproducibility and Replicability in Political Science. *Research & Politics*, 11(1), 20531680241233439.

Arel-Bundock, V., Briggs, R. C., Doucouliagos, H., Mendoza Aviña, M., & Stanley, T. D. (2022). *Quantitative political science research is greatly underpowered* (No. 6). I4R Discussion Paper Series.

Stommes, D., Aronow, P. M., & Sävje, F. (2021). On the reliability of published findings using the regression discontinuity design in political science. arXiv preprint arXiv:2109.14526.

Lal, A., Lockhart, M. W., Xu, Y., & Zu, Z. (2021). How much should we trust instrumental variable estimates in political science? Practical advice based on over 60 replicated studies. Practical Advice based on Over, 60 replicated studies

Brodeur, A., Cook, N., & Heyes, A. (2020). Methods matter: P-hacking and publication bias in causal analysis in economics. *American Economic Review*, 110(11), 3634-3660.

- All these papers are instances of a recent development to assess the trust in specific designs based on meta-reviews. We will see, that based on the results we are in a problematic state in the social sciences. However, these same articles point to clear instructions for improvement.

Block Session 13.07.2024 | 09.00 – 17.00

Part I: Causal mechanisms in large-n designs

Röth, Leonce (2022): Pathway analysis, causal mediation and the identification of causal mechanisms. In Negri, F. and Damonte, A. (Eds.). *Causality in Policy Studies*. Springer.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication monographs*, 76(4), 408-420.

- Empirical illustration:

Miguel, E., & Kremer, M. (2004). Worms: identifying impacts on education and health in the presence of treatment externalities. *Econometrica*, 72(1), 159-217.

Part II: Causality across and within a few cases

Lijphart, Arend (1971): *Comparative Politics and the Comparative Method*. *American Political Science Review* 65 (3): 682-693.

- A classic, foundational text on case comparisons that popularized the term “the comparative method”.

Rohlfing, Ingo (2012): *Case Studies and Causal Inference: An Integrative Framework*. Basingstoke: Palgrave Macmillan: Chapter 4.

- A text on comparative case studies which synthesizes work on case comparisons. The difference between correlational and set-relational research can be ignored because it is not relevant anymore (you will have seen why when we got to this part of the course).

Empirical illustration: Eckert, Sandra (2010): Between Commitment and Control: Varieties of Delegation in the European Postal Sector. *Journal of European Public Policy* 17 (8): 1231 - 1252.

Part III: Process tracing with causal models

Humphreys M, Jacobs AM. (2023). *Integrated Inferences: Causal Models for Qualitative and Mixed-Method Research*. Cambridge University Press; 2023. Chapter 7: Process Tracing with Causal Models. (https://macartan.github.io/integrated_inferences/HJC7.html)

Bennett, Andrew and Jeffrey Checkel (2014): *Process Tracing: From Methodological Roots to Best Practices*. Andrew Bennett and Checkel, Jeffrey (ed.): *Process Tracing in the Social Sciences: From Metaphor to Analytic Tool*. Cambridge: Cambridge University Press: 1-37.

Trampusch, Christine and Bruno Palier (2016): Between X and Y: How Process Tracing Contributes to Opening the Black Box of Causality. *New Political Economy* 21 (5): 437- 454.

- The three texts together give good overviews of what process tracing can be and what it is good for.

- Empirical illustrations:

Humphreys M, Jacobs AM. (2023). *Integrated Inferences: Causal Models for Qualitative and Mixed-Method Research*. Cambridge University Press; 2023. Chapter 8: Process Tracing Applications. (https://macartan.github.io/integrated_inferences/HJC8.html)

Moravcsik, A. (2013; 1998). *The choice for Europe: Social purpose and state power from Messina to Maastricht*. Routledge.

Lieshout, R. H., Segers, M. L., & Vleuten, A. M. V. D. (2004). de Gaulle, Moravcsik, and the choice for Europe: soft sources, weak evidence. *Journal of Cold War Studies*, 6(4), 89-139.

Third Assignment (Deadline 30.08):

- **Application Design**

Exam and grading

- The exam in this course is the portfolio exam. Participants have to submit multiple assignments.
- The final grade depends on all assignments. The final grade is determined based on the sum of the points across all assignments and is graded using a 100-point scale (see below).
- Failing a single assignment does not have consequences. Only passing in the end matters.
- The assignments will be graded and returned to the participants with comments.
- Submissions have to be made on ILIAS.

Total number of points and final grade

Points	Grade
100-95	1
94,5-90	1,3
89,5-85	1,7
84,5-80	2
79,5-75	2,3
74,5-70	2,7
69,5-65	3
64,5-60	3,3
59,5-55	3,7
54,5-50	4
0-49	5

You have to perform three assignments in this course. More details will be shared later during the term.

Task	Deadline	Points
Formulate a research question and write a short literature review based on the research question	29.04.2024 (incl.)	25
Based on the research question and literature review, formulate hypotheses on a causal relationship of your choice and draw them in a causal model	03.06.2024 (incl.)	35
Critically reflect on a research design to answer your research question	20.08.2024 (incl.)	40